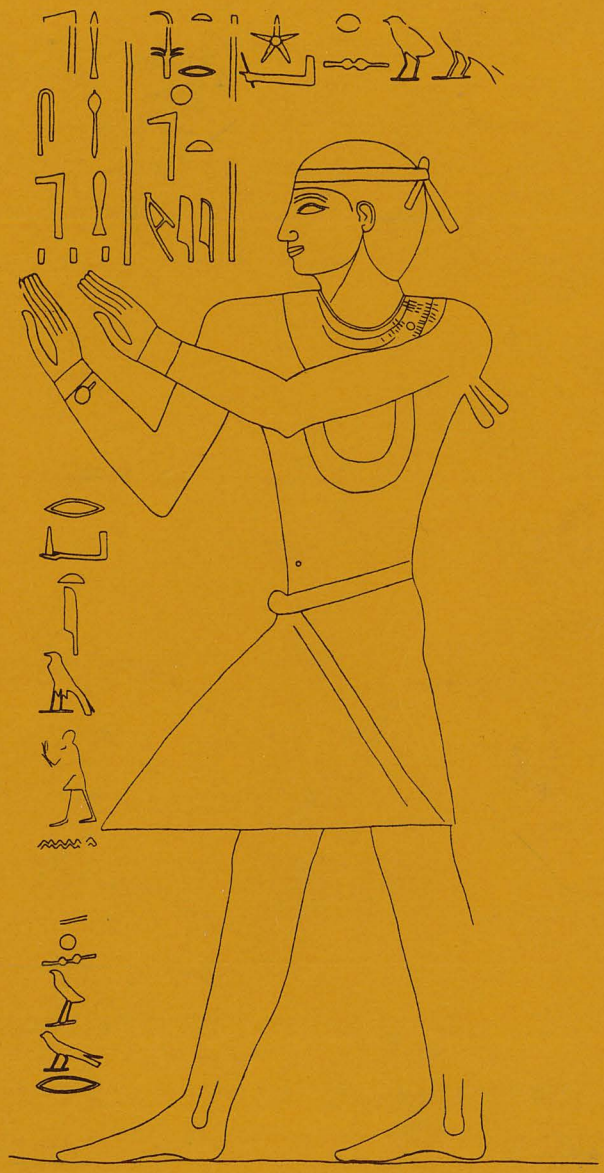
AMERICAN RESEARCH CENTER IN EGYPT

NEWSLETTER



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Cover: Tomb of Hesu the Elder, Kom el Hisn. See article by David P. Silverman. Tracing by R. Dougherty. (Preliminary)

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Betsy M. Bryan, Editor

ANNUAL MEMBERSHIP DUES (include NEWSLETTER and JOURNAL)

Student (Full-time, U.S. and Canada)	U.S. $ 20.00
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1982 ANNUAL MEETING

The 1982 Annual meeting of the ARCE will be held March 26, 27 and 28 at the University of Texas in Austin. All individual sessions are planned for the Academic Center, 4th Floor, commencing Friday, March 26, about 1:00 p.m. and ending with a general reception Sunday evening, March 28.

The decision to meet in March again was not lightly taken. Many members prefer a late April date. However, both in terms of the requirements of our various field projects and in the difficulty of scheduling a later meeting in Austin it was decided that for this one more year we would follow the plans of the American Oriental Society which also meets in Austin (March 28-31). Subsequent annual meetings will be held in late April whenever possible.

Please make your plans early. For the moment it is essential that we hear from members who wish to present papers and communications. Send your request with a 100-150 word abstract and details of special requirements (e.g., slide projector, black board) to the program chairmen listed below, for your section:

A. Islamic and Contemporary Egypt

Robert Fernea
Program Committee Chairman
Department of Anthropology
University of Texas, Austin
Austin, Texas 78712
Tel: (512) 471-4206

B. Pharaonic and Coptic Egypt

Robert K. Ritner
The Oriental Institute
1155 East 58 Street
Chicago, Illinois 60637
Tel: (312) 753-2469

The deadline for paper proposals is January 15, 1982.

OMM SETY

A PERSONAL TRIBUTE

Born as Dorothy Eady, Omm Sety became interested in ancient Egypt early in her life. For some years she used to go often to the British Museum to study its ancient Egyptian collection, looking forward all the time to going to Egypt and living among its monuments.

An opportunity for realizing her dreams occurred when she met Emam Abd El-Meguid, a teacher of English sent to England on a mission. It happened that each of them had to go to the House of Commons to mee one of the members. There they met and subsequently agreed to get married and to go back to Egypt, where she was known as 'Bulbul Abd El-Meguid'.

A short time later their first and only son was born; she called him Sety. She concentrated on studying the monuments, neglecting her household. Naturally, such a kind of life did not last long, but ended with divorce. Abd El-Meguid soon married his cousin, who proved to be a good housewife, and Omm Sety decided to devote the rest of her life to learning more about the ancient Egyptians: their history, civilization and divinities, whom she almost adored.

In the village of Nazlet El-Samman, at the foot of the Giza Plateau, she lived in a modest house and soon was engaged as secretary by the late Prof. Selim Hassan. Through him she learned much about his excavations in the area.* When he passed away, she acted as secretary for the late Prof. Ahmed Fakhry, who also helped her later to obtain work as a draughtsman for the Antiquities Department in Abydos.

There she settled for about 25 years, swearing not to pass one single night away, happy to live near the Temple of Sety I, and determined to be buried close by. During that interval, she tried to encourage and help the local inspectors, making drawings, writing reports, and happy to see some printed, even without her name.

She lived first in a zeriba (a room made of reeds), then in a modest house, built through the kindness of her many friends. Throughout these years, Omm Sety was beloved by the inhabitants of Abydos. There was hardly any group of tourists, even those accompanied by well qualified Egyptologists, which was not keen to ask Omm Sety to show them around the Sety I Temple, of which she knew every detail. Recently she took part in many documentary films, the last for the BBC and the National Geographic Society, Washington.

Her book, Abydos, the Sacred Town of Ancient Egypt, written with her life-long friend, Dr. Hani El-Zeini, director of the Sugar Factory of Nag Hammadi, is about to appear. Her other book, Survivals from Ancient Egypt, encouraged and sponsored by ARCE will appear soon.

Abydos undoubtedly will be different without Omm Sety. But she will always be remembered by the thousands who enjoyed her explanation of the scenes of the Sety I Temple, by those who will see the documentary films in which she took part, and especially by those reading her two books. They will remember her sense of humor and enthusiasm for ancient Egypt and the Egyptians, with whom she lived and among whom she decided to have her resting place in the 'Sacred Town of Ancient Egypt'.

Labib Habachi
Cairo

* Editor's Note: It has long been known among Egyptologists that Miss Eady contributed greatly to Dr. Hassan's publication of his Giza excavations.

EPIGRAPHIC WORK AT KOM EL HISN

1981

This was the second season of recording the inscribed monuments in the vicinity of the village of Kom el Hisn as part of the Naukratis expedition directed by W. Coulson and A. Leonard[1] (of the University of Minnesota and Missouri, respectively). This season, work at the site was directed by David Silverman with Roberta Dougherty and David Pendlebury as epigraphers, all of whom are from the University of Pennsylvania. Photographic records for both the 1980 and 1981 seasons were made by Mr. Duane Bingham.

Because the reconstruction of the outer housing for the tomb in the concession was still in progress when we arrived, our work began with the fragments of statues[2] dating to Ramesses II situated in the courtyard of the rest house. New tracings and collations of the inscriptions were made and compared with the work done by the epigraphers of the 1980 season, Paul Brodie and Margaret Serpico; the final drawings were then inked in. There were minor differences in the resultant texts in comparison to those records published by earlier copyists.

Several granite blocks had previously been located in the environs of Kom Firin;[3] they appear to have belonged to an ancient structure, and those that bear traces of inscriptions were recorded. Another inscribed granite block was copied, but this was from the village of Nebire.[4] Now housed within the confines of the local mosque along with some Roman column capitals, the block had been reworked as a pillar during Roman times, judging from the style of the capital. Some traces of hieroglyphs still existed, and the word dt, among other isolated signs, could be read.

Much of the work this summer centered on the sarcophagus chamber of Hesu the Elder, which lies on the slope of a mound bordering the southwestern end of a large mud-brick cemetery that dates from the late Old Kingdom.[6] Edgar had described the tomb in an early report.[7] The flat-roofed chamber measures approximately 4 m. 30 cm. long and 1 m. 40 cm. wide; it is 1 m. 95 cm. high. Rectangular in shape, the structure is built of large limestone blocks, and it has a stone pavement. Edgar assumed that it was the burial place of Hesu and that the fragments of wood found inside among the debris were all that remained of the coffin of the deceased. The exterior face is undecorated, except for the northern end which has htp dj nswt formulae, the titles of the deceased, and two seated representations of

Hesu, all arranged in the form of a lintel and jambs. Edgar mentioned that there were traces of mud-brick walls around the chamber;[8] perhaps they were all that remained of an offering chapel or other room.

Three of the four interior walls were decorated. The east wall has a small recess which has around it a lintel and jambs that contain two htp dj nswt formulae. Edgar suggested that the canopic equipment would probably have been stored in this niche.[9] There are, however, no remains of the funerary equipment; it must have been removed by robbers, evidence of whose entry can be found in a chiseled out hole in the northern end of the room. The remaining lower part of the east wall is devoted to religious texts arranged in columns; the middle section has an offering scene, offerings, and a list of offerings; and the upper part contains a long htp dj nswt formula surmounted by a hkr frieze.

The west wall is also arranged in a similar fashion, with the lower part reserved for columns of religious texts, the central section devoted to scenes of the tomb owner inspecting or taking part in various activities, and the upper part consisting of a band of text surmounted by a hkr frieze. The poor condition of the wall now makes it impossible to recognize most of the upper two-thirds.

Both the east and the west wall have a small round hole about one meter above the level of the floor, opposite each other at the south end. Edgar suggested that a wooden bar may have been in place here that could have been used in dragging in the coffin by rope. It is likely that such a beam could have functioned as a pivot for the tow ropes, but, considering the excessive weight of the monolithic block used to close the north wall, it is perhaps this slab, which must have been put in place last, that was slid into position by means of tow ropes guided by the beam. It would then have been necessary to keep at least one of the roofing slabs off until this operations had been completed.

The surface of the south wall is extremely abraded, and it is possible to make out only sections of the religious texts on the lower part. The middle section, which originally contained funerary objects in relief and the inscription and hkr frieze are totally destroyed.[10]

The north wall apparently contained no inscription or relief. The ceiling, however, has columns of religious texts carved in well-done hieroglyphs.

Several years earlier, Edgar had discovered and published in part two tombs of similar design at the nearby site of el Barnugi.[11] The interior decoration, however, was painted, not carved, as that at Kom el Hisn. All three tombs had the round holes at the south end

of the east and west walls. The tombs at el Barnugi were built of limestone, and their scanty remains were reburied after excavation by Edgar.

Our access to the sarcophagus chamber of Ḥesu the Elder was through an opening in the flat roof, made during the original clearing of the tomb. The end slab had been slid southward about a meter, so that it rested at an angle on the edge of the tomb and on the surrounding earth. (Only the north end of the structure is completely exposed, the remaining walls of the structure still having earth covering up to two-thirds of their height. This wall may never have been covered, since only it received exterior decoration and its texts are offering formulae.) The topmost course of blocks reveals on its upper face a series of carved depressions into which must have been placed dovetails of either wood or metal.

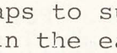
We are fortunate to have Edgar's publication of this monuments because the condition of the interior decoration has deteriorated greatly since his clearing of the site. The migrating salt within the limestone has made some of the texts unreadable, and many of the reliefs are now totally lost. Although it was not meant to be a final report, Edgar's short article has remained our primary source of information. He included line drawings of the reliefs and the majority of the formulaic texts. Virtually none of the religious texts were published by Edgar perhaps because it was assumed that Lacau, who made copies when the tomb was cleared,[12] would eventually complete this work. Lacau, however, never published these copies, and the majority of the texts have remained unknown to most Egyptologists, save for the few inscriptions recorded by Edgar.

T.G. Allen was aware of the nature of the texts and identified a few as Pyramid Texts and included them in his Occurrences in the Pyramid Texts, and he refers to photographs of the inscriptions made several years ago in the Oriental Institute.[13] Through the generosity of the Institute we had copies of these photographs made for the field which, because of the deteriorated state of the surface of the walls, became invaluable sources.[14]

The survey this year first made hand copies of the Institute prints, since the condition of the texts made tracing impossible. Then these sheets were taken to the walls for three collations of the inscriptions. The results, over eight hundred lines, in addition to the formulaic and ceiling inscriptions, were copied.[15] and will be reproduced in a standardized form (i.e., not in facsimile). In addition, the extant relief decoration that was recognizable and could safely be traced was drawn, and these will be inked in. Record photographs of the entire tomb were made.

While research on the texts is still in the early stages, we have identified in addition to those texts mentioned by Allen[16] and Lesko[17],

PT 145b - 146b, 147a - 149d, CT I 10b - d, and CT IV 8 - 9. Several other PT and CT have similarities to our texts.

Since there are so few monuments from the Delta available to us for study, we have been carefully noting any distinctive paleographic, orthographic, grammatical, or iconographic features. We hope thereby to secure a firm dating for the tomb and perhaps to suggest features characteristic of the Delta. Although still in the earliest stages of our investigation, we have noticed that: the negations nn and n occur in the texts; t is written for t:;  is written for prepositional n; the land sign has two rather than three dots; the hnty sign uses three jars, sn appears without plural strokes; and the crossbars in the 'h' sign number eight. Among the offerings on the east wall is an unfinished vase with flowers projecting from three spouts; it may have a parallel in a tomb from Beni Hasan.[18] As already indicated by those texts published by Edgar, Ḥesu has several titles, one of the most prominent of which is sb3w recently noted also in other contexts and locations by Del Nord.[19]

Each of these details represent only a small sample of the wealth of information contained in this tomb, and we hope in the coming year to identify, investigate, and research all of the features therein. While early indications imply a date that ranges somewhere between the First Intermediate Period through the Middle Kingdom, we hope to date it more securely in a complete and fully documented record of this most valuable monument from the western Delta.

Notes

1. We are grateful to the Egyptian Organization of Antiquities for allowing us to continue this work, and we greatly appreciate the efforts on our behalf by our inspectors Atlee and Rabiya. We are also thankful to the offices of the American Research Center and its Cairo Director, Dr. James P. Allen for their assistance.

2. See W. Coulson and A. Leonard, "A Preliminary Survey of the Naukratis Region in the Western Nile Delta", JFA 6 (1979) 165-66 and figs. 23 and 24. For the earlier copies of the inscriptions on these statues by Griffith, see E.A. Gardiner, Naukratis II (London: Egypt Exploration Fund, 1889,) pl. XXIV, #I (not photographed in Coulson and Leonard, op.cit., but described on p. 165, A), #II (ibid., fig. 24), and #III (ibid., fig. 23; the inscriptions on this particular piece were not copied in full by Griffith. G. Daressy, "Rapport sur Kom -el-Hisn", ASAE 4 (1903) 282-83. Consult also the forthcoming fascicle on the Naukratis expedition by Coulson and Leonard.)

3. Eight medium to large-sized red granite blocks were recorded by D. Pendlebury who is attempting to co-ordinate them with inscribed material referred to in earlier publications. See also Coulson and Leonard, op.cit., 158-70 and C. C. Edgar, "Inscribed Stones at Kom Firin and Kom Barnugi", ASAE 11 (1911) 277-78.

4. Coulson and Leonard, op.cit., 157-58, do not refer to the object but were aware of its existence and made it known to us.

5. See C.C. Edgar, "Recent Discoveries at Kom el Hisn", in G. Maspero, Le Musée Egyptien: Receuil de Monuments et de Notices sur les Fouilles d'Egypte III (Cairo: l'Institut Francais d'Archéologie Orientale, 1915), 54-63. See also the review by Gardiner in JEA 3 (1916) 19-20. For further references to the tomb see Coulson and Leonard, op.cit., 167; B. Porter and R. Moss, A Topographical Bibliography IV (Oxford: Griffith Institute, 1968), 51-52; S. Allam, Beiträge zum Hathorkult (bis zum Ende des Mittleren Reiches,) (MÄS 4; Berlin: B. Hessling, 1963) 90; T.G. Allen, Occurrences of Pyramid Texts (SAOC 27; Chicago: Oriental Institute, 1950) 24-25. See also L. Lesko, Index of the Spells on Egyptian Middle Kingdom Coffins and Related Documents,(Berkeley: B.C. Scribe Publications, 1979) 57. H.G. FIscher has referred correctly to the tomb owner as Ḥesu the Elder in Varia (New York: Metropolitan Museum of Art, 1976) 86 n.29, and he discusses one of his titles in Ancient Egypt in the Metropolitan Museum (New York: Metropolitan Museum of Art, 1977) 82 and n.24, and D. Nord has referred to several of Ḥesu's titles in "The Term ḫnr: 'Harem' or 'Musical Performers'?", in Studies in Ancient Egypt, the Aegean, and the Sudan, ed. by W.K. Simpson and W.M. Davis (Boston: Museum of Fine Arts, 1981) 144 and n. 81.

6. See PM IV, 51-52 and Coulson and Leonard, op.cit., 167. See also the excavation reports of the site by A. Hamada and M. el-Amir in ASAE 46 (1947) 101-41; A. Hamada and S. Farid, ASAE 46 (1947) 195-233; ASAE 48 (1948) 299-325; and ASAE 50 (1950) 367-99. Cf., however, the conclusions by G. Brunton, "The Dating of the Cemetery at Kom el Hisn", ASAE 46 (1947) 142-45.

7. Edgar, "Recent Discoveries", 54-63.

8. Ibid., 54-55.

9. Ibid., 55.

10. Ibid.

11. C.C. Edgar, "Middle Empire Tombs in the Delta", in G. Maspero, Le Musée Egyptien II (Cairo: l'Institut Francais d'Archéologie Orientale, 1907) 109 ff.

12. Access to these records have been sought through the Golenischev Library.

13. T.G. Allen,Occurrences, 24-25.

14. Thanks are due to the former Director of the Oriental Institute Dr. John A. Brinkman who allowed us access to this material and gave

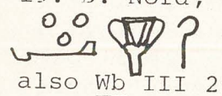
the permission to publish the photographs in a forthcoming edition of the texts and decoration in the tomb.

15. The numbering system follows that used by T.G. Allen, Occurrences, 45.

16. Ibid., 61-100.

17. Although not used by de Buck for the Coffin Texts, Lesko, Index to the Spells, 57, has included the texts among his sources and has identified a few of the spells used in Kom el Hisn.

18. The vessel in question is illustrated in Edgar, "Recent Discoveries", pl. XXXIV, and it appears two times in P.E. Newberry, Beni Hasan I (London: Kegan, Paul Tench, Trubner, and Co. , 1883), pl. XVII.

19. D. Nord,"The Term ḫnr", 144. Note that Ḥesu is also designated  , and a similar phrase is accorded Amenemhet from Beni Hasan (Newberry, Beni Hasan I, 12 and pl. XVII. See also Wb III 245:27). For the title ḥk3 ḫ3t, see H.G. Fischer, "Old Kingdom Inscriptions in the Yale Gallery", MIO 7 (1960) 314-15 and "The Cult and Nome of the Goddess Bat", JARCE 1 (1962) 12-13.

David P. Silverman
University Museum
University of Pennsylvania

FIG. 1 TOMB OF HESU THE ELDER AT KOM EL HISN

FOOD PRODUCTION IN THE PALEOLITHIC?

EXCAVATIONS AT WADI KUBBANIYA: 1981

From January 20 to March 20, 1981 the Combined Prehistoric Expedition conducted archaeological investigations at Wadi Kubbaniya, on the west bank of the Nile, 28 km. north of Aswan, Egypt. The work was done in the same area studied in 1978, where four grains of cereals, three of barley and one of einkorn wheat, were found in a typical Late Paleolithic site. Radiocarbon analysis of charcoal from these sites, and several other similar sites nearby, yielded eight dates ranging from 18,300 to 17,000 years ago, much earlier than any previously known occurrence of cereal utilization anywhere in the world.

These initial excavations at Wadi Kubbaniya posed a significant challenge to the generally accepted view that food production began only after the beginning of the Holocene (ca. 10,000 years ago), and that it occurred somewhere in the Levant, where the wild relatives of the first domestic cereals, wheat and barley, grow today. It also questioned the assumption that food production, once begun, led to rapid social and demographic changes in response to this newly available source of energy, and to the requirements of plant husbandry. In the ensuing controversy, questions were raised as to whether the cereals were actually associated with the Late Paleolithic settlements at Wadi Kubbaniya, or if somehow they had been accidentally intruded into the site.

The new excavations at Wadi Kubbaniya were intended to resolve these questions; if possible to obtain additional examples of cereals, not only to establish conclusively their association with the sites, but also, it was hoped, to provide data which might permit a firm conclusion as to whether the cereals were wild or domestic. In addition, we hoped to clarify both the stratigraphic and paleoenvironmental setting in which the Kubbaniyan sites occur, to obtain further data on the patterning of the settlements and the seasonality of the occupations, to investigate variability in internal site organization, and to study stylistic relationships between the settlements.

The Geological Framework

Geological investigations during this season concentrated on detailed mapping of an area extending for two kilometers along the

left bank of the modern wadi channel; thus incorporating all of the Late Pleistocene sediments in this area, as well as most of the known Late Paleolithic sites. Four major silt units, three aeolean episodes of sedimentation, more than ten washes, and several lacustrine deposits have been mapped. The map, at a scale of 1:2000, will serve as the basis both for our environmental reconstructions and for determining where further excavations should be made.

A second map, by Dr. Irina Springuel and Dr. Nabil el Hadidi, is being made of the fossil vegetation which occurs in the aeolean units. This widespread vegetation takes the form of fossilized, calcareous trunk and root casts and is exceptionally well preserved. Identification of many of the casts is possible through the use of thin sections, which are now being prepared.

Most of the lithostratigraphic investigations this year were concentrated at the eastern end of the wadi, near its mouth, where it was possible to study the relationship between a well developed series of later units and the earlier units which were studied in detail during the 1978 season. These studies showed that an intricate series of sediments had been deposited above the older dune and silt complex in which Kubbaniyan sites are embedded.

It appears that the earlier, Kubbaniyan series,of interfingering silts and dunes is separated from the overlying one by an episode of a lower Nile. During this period of lower Nile there was a pronounced and areally extensive truncation which cut into the older dune. Over the truncation is a sheet of coarse aeolean sand, deposited under arid conditions, when the groundwater level was well below the surface, and there was no vegetation which could encourage the formation of dunes. During the succeeding interval of rising Nile, interfingering silts and sheet sands were deposited along the river border zone, near the mouth of the wadi. This new set of interfingering sands and silts begins another long sequence of rising Nile, accompanied by simultaneous aeolean and lacustrine sedimentation (Fig. 1.).

The rising Nile encouraged the formation of a new series of phytogenic dunes, closely similar to those which developed during the preceding aggradation when the Kubbaniyan occupation occurred. The new dunes, as before, interfinger with silt horizons throughout their total thickness on the riverward side. During the latter part of this episode a dune barrier formed which closed the lower part of the wadi, and prevented further Nile silt deposition in the wadi and a series of diatomites and lacustrine silts was deposited in this area. The level of the Nile continued to rise, however, and near the maximal stand of the lake occasional Nile floods would pass over the barrier and deposit silts. These floods finally

breached the barrier and deposited a thick layer of silts over the diatomites. At its maximum, the lake formed extensive beaches, now largely destroyed, made up of crushed snail breccia and sands. The final episode of silt deposition closes the Late Pleistocene Nilotic deposition in the wadi. It seems likely that the high floods which broke the barrier may be contemporaneous with the highest, final Nile stands of the Sahaba-Darau aggradation, which is dated to ca. 12,000 B.P.

Archaeology

During the 1981 season ten archaeological sites were investigated. Five of these sites (E-78-2, E-78-3, E-78-4, E-81-1 and E-81-6) are associated with the lower dune series; three are within an early section of the second dune/silt episode (E-81-3, E-81-4 and E-81-7); one site (E-81-5) was associated with the beach of the highest lake stand, and the last site (E-81-2), on the east bank in Wadi Abu Subeira, is of a Middle Paleolithic character and is associated with Nile sediments of an unknown age.

Excavations at Sites within the Lower Dune Series

The most extensive excavations took place at two sites, E-78-3 and E-78-4. At E-78-3, the 1978 excavation was extended by a trench 33 m. long, 2 m. wide and 1-2 m. deep. This trench was parallel to the direction of dune movement and revealed a total of 22 detectable, archaeological horizons within the foreset beds of the dune (Fig. 2). The horizons fell into two major groups. The earlier group is represented only by thin traces of human occupation in which seems to have been a quite rapidly moving dune, with no signs of long-stabilized surfaces. This was followed by a virtual hiatus in occupation, the only signs of human activity being traces of charcoal and and very rare lithic artifacts and bones. The duration of this hiatus remains unknown until the results of the radiocarbon analyses are available, but it need not have been long if, for some reason, the dune was moving with unusual rapidity. It was followed by the second major group of occupations, part of which was studied in 1978, and which seems to be associated with a major pause in the dune movement. The archaeological horizons in this group are very rich and obvious, and can be followed during excavation as intact surfaces. This second series of occupations has two radiocarbon dates of 16,960 B.P. ±210 years (SMU 599) and 17,930 B.P. ±380 years (SMU 596).

All the recovered lithic assemblages fall within the Kubbaniyan tradition, as it is already known (Wendorf, et al., 1980). Artifacts from the later group of occupations are essentially the same as those already described from the 1978 investigations, but the earlier group seems to be slightly different. Although the tool-kit is still dominated by blunt and partially backed Ouchtata bladelets, ordinary obverse backing is approximately twice as common as in the later series;Levallois technology and the use of prized Egyptian

flint - both infrequent but extremely diagnostic features of the later series - are almost absent, and burins are totally lacking. There is no doubt that all of the material from E-78-3 falls within the Kubbaniyan tradition, but there seems now to be more temporal variation within this industry than had originally been thought.

Flotation cannot be used for the recovery of organic remains from the Kubbaniyan sites (or, indeed, from any of the sites in the Egyptian desert) since charcoal immediately disintegrates on contact with water. Biological specimens from E-78-3 and E-78-4 were therefore recovered by passing all of the excavated deposits (over 100 $m.^3$ at Site E-78-3 and 64 $m.^2$ at Site E-78-4) through a series of graded sieves, with mesh-sizes of 2.5 mm., 1.7 mm. and .9 mm. Archaeological material was picked by hand from the largest screen, and the residues collected on the smaller screens were bagged. All the materials were submitted to a botanist at Aswan University, Dr. Irina Springuel, for preliminary examination. Small bones and artifacts were returned to their respective collections, and plant remains were given to Dr. Nabil el Hadidi, of the Cairo University Herbarium, for identification.

Preliminary studies indicate that, as well as numerous fragments of wood, the following plant remains can be identified from E078-3: the later series of occupations yielded a rachilla of barley, a chickpea and a lentil seed; the earlier occupations yielded a complete and very well preserved date stone, and over 200 cereals and fragments of cereals. All of these specimens were in situ, below clear and undisturbed dune depositional features, and associated with human occupations. So far, only preliminary identifications are available, but the cereals are now being studied, using a scanning electron microscope, at the University of California, Davis, by Dr. Ann Stemler and Dr. Richard Falk.

It is significant to note that the cereals do not occur generally throughout the deposits, nor were they associated with most of the cultural horizons. Instead they occur in clumps, a distribution which probably reflects unusual accidents of preservation, the taphonomy of small open air dune sites and the unique destructive forces which inhibit the preservation of cereals in such sites. It seems certain that the failure to recover cereals from such excavated sites cannot be taken as conclusive proof of their absence.

Work at E-78-4 was designed to expose and study actual living surfaces (Fig. 3), rather than to reveal the overall stratigraphy and archaeological sequence at the site, as was done at E-78-3. An area of 32 sq. m. was excavated at E-78-4, to depth of 1.5-2.0 m. Six occupation layers were defined (a-f), and a seventh (g) was exposed but not excavated. The layers sloped toward the south, gently in their upper portions and more steeply in the lower parts, and were generally composed of brownish, unbedded, silty sand, 3-10 cm. thick, with the proportion of silt increasing downslope.

The occupation layers were separated from each other by layers of loose, white sand, 5-60 cm. thick.

The occupation layers were excavated and mapped one at a time, and all deposits were sieved and subjected to the same system of analyses as at E-78-3. A large hearth of fire-cracked rock, but without other indications of construction, was found in Layer a, surrounded by an area of unusually few artifacts and bones. Although fire-cracked rock was frequent throughout the excavation, other possible hearths were no more than concentrations of charcoal. Both Layers b and c did, however, show considerable variation in the horizontal distribution of archaeological materials. Unfortunately the major concentrations extend into areas which are not yet excavated.

Again, all the artifacts recovered from E-78-4 may be ascribed to the Kubbaniyan, but they do increase our knowledge of that tradition. Layer a, the uppermost horizon, is a continuation of that excavated in 1978, and the artifacts do not differ. The tool-kit, here and throughout the sequence, is characterized by scaled pieces and backed bladelets, predominantly with Ouchtata retouch. There are, however, significant variations in the frequencies of raw materials, with Egyptian flint being most common at the beginning and end of the sequence, while local Nile chert was almost the only raw material used in Layers b and c. It is worthy of note that a number of ostrich eggshell beads were recovered from E-78-4, some of them showing red stains. These are the first to be found associated with the Kubbaniyan industry, and are among the earliest known.

Site E-78-4 yielded very large amounts of charcoal, all of which was examined for recognizable plant fragments. Two layers in the site yielded fragments of cereals, which are probably barley, and one yielded a slightly broken date stone.

Excavations at the Upper Dune Series

The Kubbaniyan occupation seems to be limited to the period of the initial silt/sand deposition. It is followed by a significant interval during which there are no traces of occupation, and when the level of the Nile was much lower. Subsequently, the Nile once again began to rise and overflowed into the wadi where sands interfingered with the floodplain silts. There are numerous sites associated with the sediments which were deposited at the beginning of this new episode. Three of these sites (E-81-3, E-81-4 and E-81-7) were excavated, and at two of them (E-81-3 and E-81-4) the excavations were extensive. Both of these sites are located close together at the eastern end of the Late Pleistocene complex, and the in situ occupations occur within reworked aeolean sands and lenses of Nile silt, which were deposited within a narrow bay formed within the dune and silt deposits. This bay was invaded by the Nile during its seasonal maximal stand, while it would become a pond and probably also a fish trap during the seasonal lowering of the waters. Stratigraphically E-81-4 is the younger of the two sites. Each of the sites seems to have had several rather short-lived occupations. Hearths, marked by

dense concentrations of charcoal, were observed at E-81-4, and the E-81-3 excavation yielded hearths, two small pits and two large shallow pits, which may have been either house or storage structures.

The lithic artifact assemblages from the two sites are closely similar to each other and very different from the preceding Kubbaniyan industries. Cores are unusually numerous and the great majority are made on quartz. Almost half of all cores are unclassifiable or fragmentary, and most of the remainder are of the single platform variety. Tools are relatively infrequent, but include a much higher proportion of fine-grained rocks (principally chert) than do the cores. The major tool-types are continuously retouched pieces and notches and denticulates (the last two often made on quartz flakes), but there are a few backed bladelets and occasional double-backed perforators. Scaled pieces and the backed bladelet types typical of the Kubbaniyan are lacking at these two sites, and grinding stones also are almost absent: one was found at E-81-4, none at E-81-3 and careful survey of the entire surrounding area found only three more examples. Sites E-81-3 and E-81-4 are not Kubbaniyan and cannot at this time be assigned to any industry presently known from the Nile valley.

Excavations at the Maximal Stand of the Lake

A massive dune barrier formed near the eastern end of the wadi in the later part of the second episode of Nile aggradation. The barrier prevented the Nile floods from invading the wadi, but seepage through the sand led to the development of an extensive lake in the wadi behind the barrier. The beaches deposited during the maximal stand of the lake were surveyed intensively, but most of the sites associated with them have been destroyed by deflation and slope activity. One spot did, however, show fresh artifacts eroding out of the sediments, and a surface collection and limited excavation were carried out here (Site E-81-5). The artifacts were found to occur *in situ* in the base of the beach and in the very top of the underlying silt. Associated with them were *Unio* shells, fish remains and a few mammalian bones.

The recovered lithic assemblage is small, but is rather distinctive and different from other assemblages known from Wadi Kubbaniya. The debitage consists primarily of large quartz flakes, while the rare tools are almost all large and fine end-scrapers made on Egyptian flint. Grinding stones, both upper and lower, are also present.

The high frequency of endscrapers and the presence of grinding stones suggest that E-81-5 may be an occurrence of the Esnan industry, which is known from sites farther north in the Nile Valley where it is dated to ca. 12,000 B.P. Such a date is in accordance with the stratigraphic position of E-81-5. Other grinding stones and endscrapers have been noted as surface occurrences elsewhere along the beach, so there may originally have been a fairly substantial Esnan occupation of Wadi Kubbaniya.

Dr. Fred Wendorf
Southern Methodist University

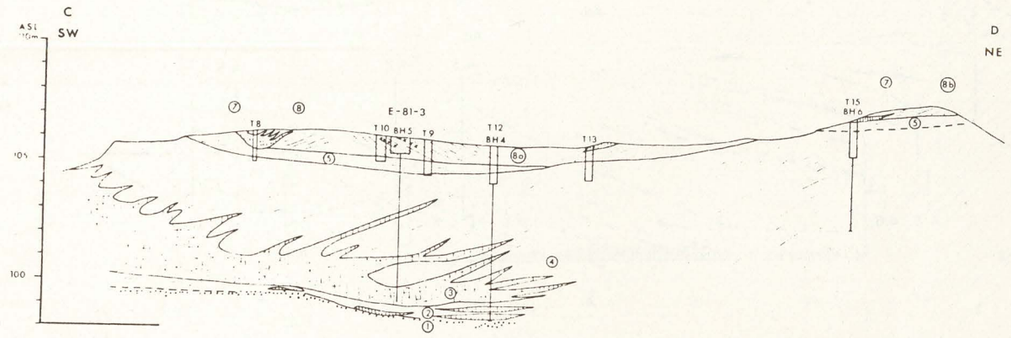
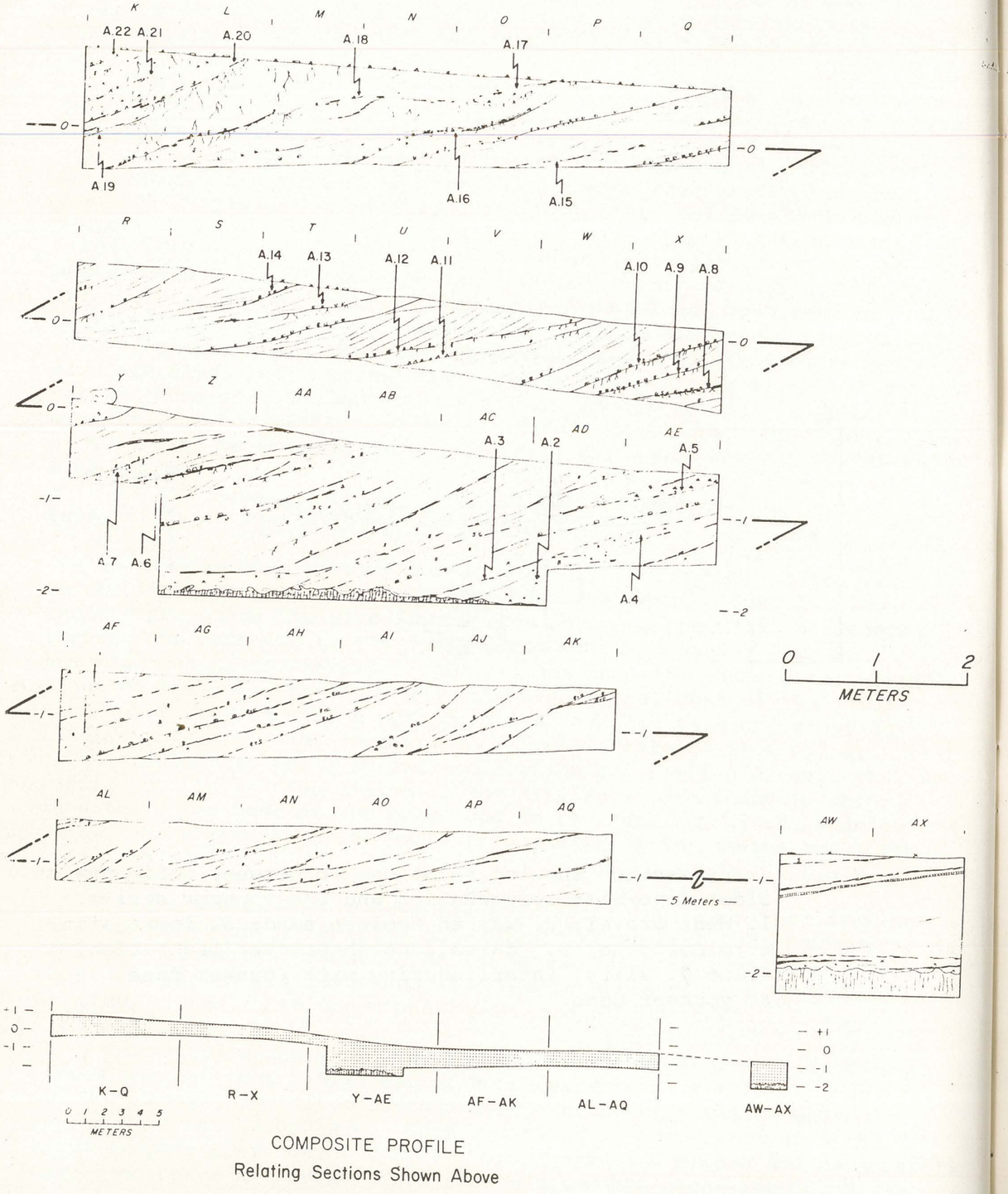


Fig.1. Cross-section showing relationship between sediments of older dune/silt accumulation and the younger series. 1. Wadi gravel; 2. washed aeolean sand; 3. lower silt; 4. older dune; 5. coarse sand sheet over truncation; 6.and 7. silts, interfingering with younger dune 8. younger dune.



COMPOSITE PROFILE
Relating Sections Shown Above

Fig. 2. Profile of trench at Site E-78-3. Note series of archaeological horizons (A.1-A.22). Large group of cereals recovered from level A.5.

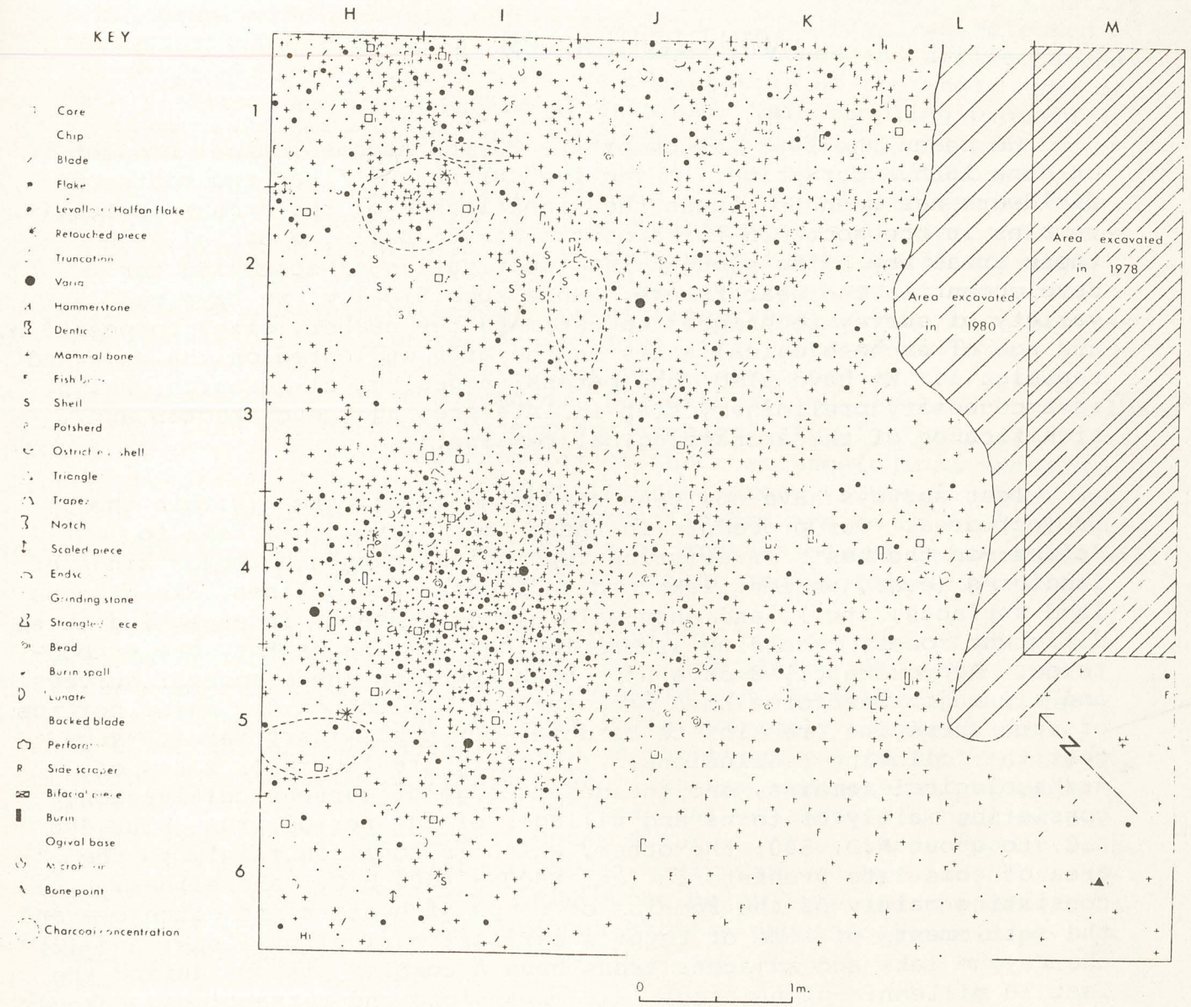


Fig. 3. Scatterpattern of all artifacts from Layer b, Site E-78-4

FAYYUM EXPEDITION, 1981

We began the 1981 season of the Fayyum Archaeological Project on June 16th. Our primary objective during the first two months of fieldwork has been to assess the significance of the archaeological remains in the southern third of the Fayyum Basin, especially in those areas now being brought into cultivation or scheduled for development in the near future. More specifically, we have used a variety of survey techniques to estimate the number, size, composition, and age of archaeological sites in the area indicated on the attached map,Fig. 1. We have also done extensive geological research, which is a necessary preliminary step in interpreting the character and significance of the archaeological remains.

Test surveys have now been conducted in all areas within the project area. Our procedure in these test surveys has been to define--on the basis of existing topological maps--the major kinds of landforms (e.g., ancient lake bed sediments, beach lines, Pleistocene land surfaces, etc.), and then walk along transects intercepting these different zones, recording archaeological remains as they are encountered. Approximately 8 days have been spent in these general surveys and all major landforms have been sampled. Although the major portion of such surveying remains to be done, our preliminary results suggest the following conclusions: (1) there are two major zones of archaeological remains, one the desert edge of current cultivation, consisting mainly of towns and villages of the period from about 300 B.C. to about A.D. 300; the other, which is confined mainly to the area of some late prehistoric (ca. 8000 - 4000 B.C.) shorelines, consisting mainly of the remains of camps of hunters and gatherers and the settlements of some of Egypt's earliest agriculturalists; and (2) the Fayyum lake and adjacent areas have a complex history during the last 10 millennia of numerous lake expansions and retractions, changes in precipitation rates, and highly variable effects of sand duning, deflation, and other aeolian processes. In addition to its archaeological relevance, our geological research has implications for modern agricultural development projects in this area. For example, our evidence suggests that severe wind erosion and sand duning about 6000 years ago caused widescale abandonment of agricultural lands in the areas 5 to 10 kilometers southwest of Quta (Fig. 1), and that these same processes will severely limit the success of agricultural development projects already underway in this area.

A major portion of our first two month's work has been spent in intensive surface sampling and topographic mapping of early

Holocene (ca. 8000 - 6000 B.C.) and Neolithic (ca. 5000 - 4000 B.C.) occupations in the areas indicated on Fig. 1. Our procedure has been to collect all the artifacts and animal bones in approximately 1,290 5 X 5 meter squares randomly selected in the area approximately 1 kilometer wide and 1.25 kilometers long. This area was selected because it contained dense concentrations of bones and artifacts and seemed in general topology to be representative of the whole area of Late Pleistocene and Neolithic occupation. This sampling procedure produced hundreds of thousands of stone tools, bones, and pottery fragments, all of which will be tabulated and the results used to produce computer-generated maps that will indicate settlements types and patterns. We have made such heavy investments of time and labor in this sampling procedure because only with this general approach can one estimate with statistical reliability the variation in the composition and spatial patterning of these remains. We can then use these analyses to estimate the relative importance of different kinds of sites and areas, in the event that at least some of the sites will be destroyed in the future. For example, our preliminary analyses suggest that at least some areas are archaeologically "redundant", in the sense that the characteristics of their archaeological records are preserved in better condition in other areas. Thus, if some but not all areas in which these sites are located are to be brought into cultivation, we will know what kinds of archaeological information will be lost and which areas are least important archaeologically.

One particularly significant result of our surveys is that we are now able to define large areas that are almost wholly without archaeological significance. For example, on the basis of our geological research and test surveys, it is extremely unlikely that there are any archaeological sites in the thousands of square hectares between the Middle Paleolithic beach line and the general region of the Wadi Riyan (see Fig. 1) -- an area that is already scheduled for agricultural development in the near future. Also, there appear to be only a few sites -- most of which are badly damaged by wind erosion -- in the area between the late Pleistocene beach line and the desert boundaries of the major Graeco-Roman sites along the southern periphery of the Fayyum.

Our research plans for the coming months include extension of our surveys to increase the reliability of our conclusions, test excavations to determine the damage to various sites through wind erosion and other factors, and study of major sites for purposes of completing an archaeological guidebook to the Fayyum.

Although initially hampered by the absence of municipal water supplies and other amenities, our living situation has now greatly improved, primarily because of the assistance of Governor Hamdi Hakim and his staff, who has graciously arranged regular water deliveries from Ibshway. We have lost some time to pervasive and recurrent

gastrointestinal ailments among the staff -- a result in part of the lack of adequate sewage disposal.

Our community relations have been quite good, in general. Except for domestic staff, we have employed only 4 workmen for about one week (for geological test trenching). Our operation in the local community has been greatly facilitated by the efforts of Miss Nihad 'Az Ahmad (our Antiquities Inspector), the local police, the municipal water authority in Ibshway, and Governor Hakim and his staff.

August 10, 1981

Drs. Robert J. Wenke &
Mary Ellen Lane

Co-Directors for the
Fayyum Project

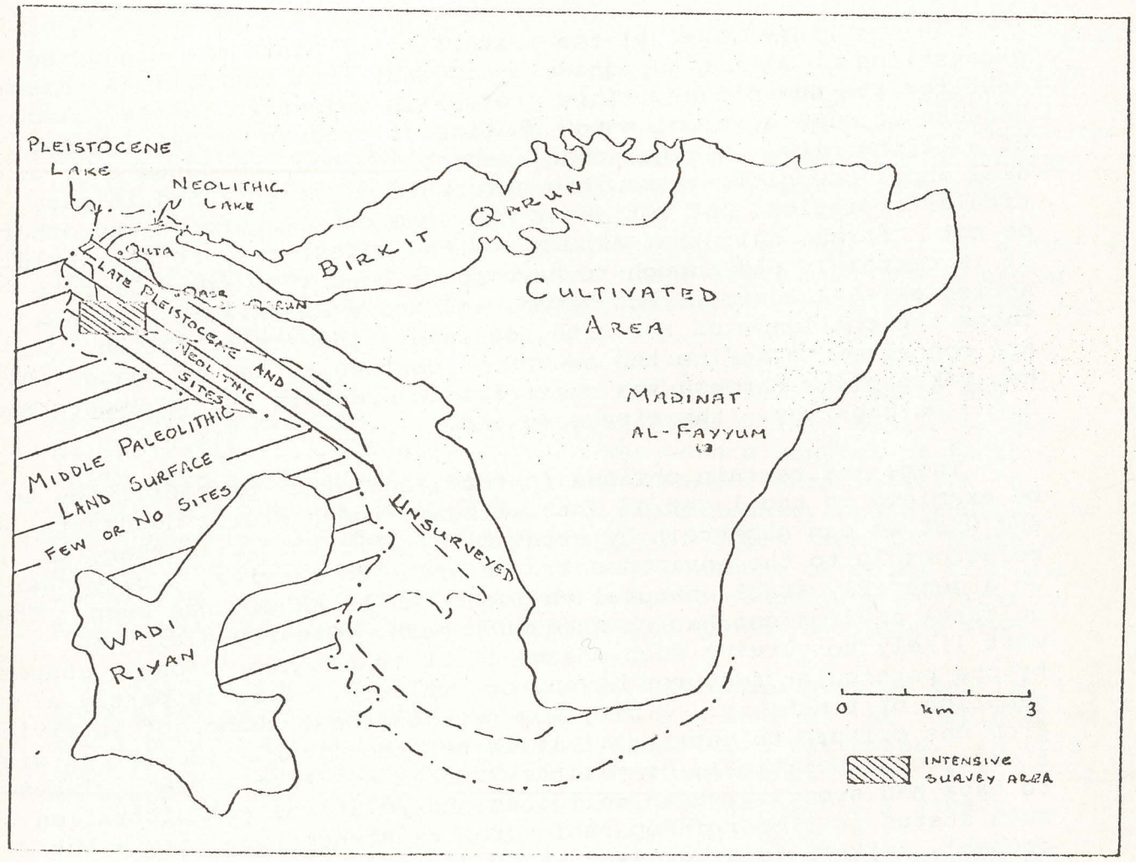


FIG. 1 FAYYUM SURVEY

SURVIVAL OF A CITY

EXCAVATIONS AT AKHMIM

In the winter of 1981 the University of Minnesota conducted excavations in Akhmim supported by a grant from the National Endowment for the Humanities. This project is unique so far as I know because it aims at tracing the continuous process of development of a living city. Recent urban archaeology has indicated a great deal about how cities came into existence and functioned in particular societies, but not about why some cities survive and others do not. Strabo said that Akhmim was the oldest city in the world. It is certainly old enough to have functioned in three different societies: Pharaonic, Greco-Roman, and Medieval Islamic. It now faces the challenge of a fourth, of modern industrialization. We are concerned to define the amount of continuity and of change which has taken place through the centuries in order to try to understand how - perhaps why - the city survived.

There are certain obvious factors, and other probabilities to be examined in the light of what we know from historic documents and what we can ascertain by excavation. First of all, there is relationship to the environment. In order to survive, a city must be in a generally stable natural environment, as Akhmim has been. The cultural environment has changed much more. Clearly a city is most likely to survive such change if it is not too strongly shaped by the particular features of any one culture. This is partly a question of functions: a city may have the best chance of surviving from one culture to another if it is not too closely identified with a religious, political, or military function. Akhmim seems always to have had some status in religious and political administration - such status is almost inseparable from existence as a city - but probably neither role was ever important enough to dominate the urban organization.

The economic functions which historians record for Akhmim are those which are linked to specific cultural situations, but there must have been others to allow it to survive. Archaeology is particularly suited to provide information on trade, on standards of living, on manufacturing etc. and to supply types of data in which change and continuity can be objectively measured.

The city has been famous for two types of production. Strabo said it was renowned for its stonemasons and for its textile workers. The Medieval Arab geographers mention its spectacular temples, and nineteenth century discoveries abundantly confirmed its manufacture of elaborate textiles. Building in stone was important through two cultures - the Pharaonic and the Greco-Roman - but then lost its value, and the craft disappeared. Textile production on the other hand did survive: it is mentioned in the Medieval period, and it is still going on today. It could of course have been reintroduced from time to time, but I would suppose, and look for proof in excavation, that it was continuous: that life in the city was never disrupted in ways that would cause training in that craft to cease, although it certainly was disrupted in ways that stopped training in, and patronage for, masonry. Production of the elaborate textiles was for a specific clientele, and was relatively short lived: what we are looking is the existence of a more utilitarian industry with greater survival power. We can also expect to find continuity in other similar activities, such as bricklaying and pottery-making. Elegant ceramics, whether local or imported, might be expected to appear and disappear, while local coarse ware of reasonable quality should continue.

When we turn to consider trade we would expect to find a similar pattern: continuity in at least one trade route and type - probably utilitarian - of goods - but variety in other routes and types, and in overall volume.

It is of course the Nile which established the major and unchanging avenue for trade from prehistoric times until the coming of the railroad. Downstream trade has been a consistent factor, while upstream trade may have varied in importance relative to clockwise trade via the Red Sea and cross-country trade routes. We may therefore look for a steady supply of goods from the south at Akhmim, and for greater variation in the amount of goods from elsewhere. We may also expect to find a steady supply of utilitarian goods, with fluctuation in both type and amount of luxury items.

Initial excavation has confirmed the usefulness of testing these general propositions while also indicating some of the complexities involved in defining and measuring significant variables. In this report I want to indicate the nature of the work, rather than to attempt to cover all its aspects or give final results for any aspect.

In 1978, trial excavation was carried out in the churchyard of Abu Seiffein (Newsletter 107 (1978/79)). Two four meter square soundings were opened: square 1 at the bottom of an existing building excavation, and square 2 at the present group level. The former revealed remains of brick structures provisionally dated to the late Roman or early Islamic periods, and the latter uncovered a Coptic cemetery, roughly seventeenth to nineteenth century, and then successive trash levels down to approximately the twelfth century. During the field season in 1981, while excavation was carried out

in two other places and supplemented by surveying and sample collecting in the city and its environs, the major activity was again at the site of Abu Seiffein. It is from finds in this area that a continuous picture of development is first beginning to emerge, and that is what I will discuss here.

Excavation at Abu Seiffein in 1981 was directed by Peter Donaldson with the assistance of Cherry Nelson. In the area of square 1 the horizontal extent of excavation was almost tripled and then explored to a depth between two and two and a half meters. The upper square was carried down two and a half meters, at which point the sides became dangerous, so the upper levels were cleared back approximately a meter on three sides.

The upper area, area 2, continued to yield trash deposits. Some architectural debris was found, but no structures. The major walls discovered in square 1 during 1979 proved to form part of a three-room structure provisionally identified as a house. It had gone through a series of phases. During the earliest phase reached in 1981 the line of one major wall, D, had already been established, but the rest of the space was cut up by a number of short, small walls. Further excavation will be necessary to elucidate the plan of this phase. In succeeding phases, one basic plan was maintained with minor repairs and alterations including the addition of two 'walls' of broken amphorae - possibly for planting? During the final phase, the doors between the rooms were blocked.

Most of these building phases were being tentatively ascribed to the late Roman period because of the absence of glazed wares in the associated levels, and the prevalence of red slipped ware types dated by Hayes fifth to seventh century or earlier. However toward the end of the season two Islamic inscription fragments came to light under a floor in one room. Therefore, while the lowest levels may be Roman, the later phases must belong to the early Islamic centuries, perhaps seventh to ninth. The fragments are among the earliest Islamic inscriptions from Egypt, occurring several centuries before Arabic writing became common in this area.

As other excavations have already shown, production and trade in red slipped wares clearly continued uninterrupted from the late Roman into the early Islamic period. Change in the pottery inventory did mark this transition at Akhmim, but it is to be found less in types than in proportions of pottery.

The proportions of locally produced coarse ware, called "b" ware, can be taken as one key to what was occurring. It is prevalent in all levels, including modern debris. In the earliest, possibly late Roman, levels of area 1 it forms a relatively minor part of the whole pottery inventory: for instance, in the very lowest level it constituted only 16% of the pottery by weight, 18% by count. Then the percentage rose precipitously: by locus 177, the locus with the inscription fragments, "b" ware formed 60% and it remained above 40% through several

more levels (these percentages, and all succeeding ones, are by weight). This decline in the relative amount of fine wares being made or imported seems to indicate impoverishment at the conquest period and immediately afterward. The percentage of red slipped ware sherds falls briefly from 3 to 2%, but quickly rises again. These sherds are primarily of Egyptian A ware from the south, probably around Aswan, and smaller amounts of Egyptian B ware from the delta. The types remain the same, although there are more decorated sherds in the lower levels.

In the upper levels of area 1, "b" ware fluctuates between 30 and 40%, indicating economic recovery with more use of fine wares, both local and imported. The percentage of red slipped wares is very low, because glazed wares begin to supercede them as the most significant fine wares. Largely on the basis of these glazed wares we may provisionally date these levels to the tenth and eleventh centuries.

In the next levels in area 2 (area 1 has no higher levels preserved) the percentage of "b" is still lower, between 15 and 20%. The amount of glazed ware rises. The red slipped wares are at first fairly well represented, running between 1 and 6%, and then decline. The Egyptian B wares disappear, either because production had ceased or because upstream trade had declined. The Egyptian A wares continue to form a measurable if small component, about one third of a percent, until perhaps as late as the twelfth century. The shapes and the fabric are the same as those at the earlier levels, but the sizes are larger, the workmanship is coarser and decoration ceases.

In the upper levels of area 2, running through the Mamluke period to the present day, the picture changes drastically again. The proportion of "b" wares fluctuates greatly from level to level, but is seldom less than 30%, and often much more - there are new variables to consider, and we cannot yet be sure that the high percentage can still be equated with impoverishment. The red slipped wares finally cease to form any measurable part of the inventory, although mixing of debris does cause individual pieces to appear throughout. Glazed wares, local and imported, form a large percent of the whole, and they become much coarser in fabric.

From the two test squares excavated in 1978 1,616 kilos of pottery were excavated, of which 344 kilos, or 21%, were catalogued. The sifted levels in 1981 produced 3,530 kilos of pottery (147,094 sherds) to be typed, weighed and counted. 485 kilos (14,845 sherds) were catalogued. Several thousand more sherds from unsifted levels were also catalogued. This prodigious task was carried out by Ivanica Schrunk with the assistance of Jerome Schaefer. Six girls from Sohag and Akhmim helped very efficiently with the processing. Over 2000 small finds of various types were processed by Margarethe de Neergaard.

This amount of data can only be handled by a computer recording system. Between 1978 and 1981 I worked on the basic outlines of a

system suited to our specific aims. Refinement of specifics is still continuing. This is an extensive and difficult undertaking, drawing on the resources of the University of Minnesota's Computer Center. Its director, Peter Patton, is a consultant to the project. Debra Katz supervised the initial stages, and Vicky Walsh and Tom Rindflesch are carrying on the work. Wing Sang Chan is now devising programs to obtain some of the information we seek. We are also receiving technical assistance from Control Data Corporation as part of a project directed by Robert Arthur to develop artifact recording systems.

Most of the pottery is now at the University of Minnesota, where the data are being handled by several students: Tim Ecklov, Ruth Tate, George Atkins, and Fanny Georgiouargyropoulou. We are in the middle of preliminary statistical analysis. Many other variables are involved besides those I have mentioned: other pottery types, glass, etc. must play their part in any full interpretation. In addition to studying the material from Abu Seiffein, we will compare the distributions at Abu Seiffein with those in the much earlier levels excavated by Jerry Schaefer in the market place. Various studies such as that of the organization of the textile industry (Cherry Nelson) distribution and development of Coptic monastic sites in the neighborhood (Sameh Adley, myself), attempts to trace an overland trade route to the Red Sea, etc. are also underway and will play their part in completing the picture of the evolution of urban life at Akhmim.

Sheila McNally
Project Director
University of Minnesota

EFFECTS OF MECHANIZATION IN AGRICULTURE

ON A VILLAGE IN EGYPT

This report covers the period from September 1, 1980 through August 31, 1981, during which I was engaged in research in the village of Musha, near Assiut in Upper Egypt. The basic problem had to do with the impact of agricultural machinery on rural social structure. The general hypothesis was that the mechanization of work in the fields would result in changes in the social organization of work, and hence of family structure, sexual and other divisions of labor, community organization, and in culture and society in general. This implies an emphasis on the role of production, of work, in providing the economic base for society, culture and population.

My task in carrying out this research was thus first of all to establish the amount and kind of farm mechanization and to observe the ways in which people worked with, or without, machines. In addition, certain basic facts about the village--here considered as a site for problem-oriented research, not the object of study itself - had to be assembled. Then it was necessary to gather data relating to other aspects of the village's socioeconomic life so as to be able to make arguments concerning the relationship of farm mechanization to, say, labor migration or farm size.

To achieve these ends I gathered data in a variety of ways. In the first place, there was "participant observation"; I lived in the village during my field stays, amounting to roughly five months in all. I also made photographic records and conducted surveys.

The research site is the village of Musha, approximately 15 km. south of Assiut and 400 km. south of Cairo. Musha has a population of around 18,500 people on a village land area of 5,000 feddans. According to the 1976 census figures, the density was 3.31 persons per feddan; the range for nearby villages was from 1.92 to 8.23, so Musha's density is slightly less than average. The main crops are, in the winter: wheat, bersim, beans, chickpeas, and lentils; and in the summer: cotton, maize and sorghum. In addition, animal husbandry, grapes and onions are important. Approximately 2,800 children were enrolled in the local primary and middle schools. For secondary school and university, Musha young people must go to Assiut. The village is overwhelmingly Muslim but with a Christian minority of about 10%. Since December, 1980, it has been connected to the main Cairo- Aswan road by a paved road, and is served by buses and taxis.

Village landholding has always been somewhat skewed. There have long been large land holdings, which were the support of the principal families in the village. Currently somewhat more than half the population is landless, although it does not follow that all the landless rely on day labor in agriculture for a living. Over 85% of landholdings are under five feddans. At the upper end, the figures for "holdings" are no longer accurate and one must look at the enterprise. There are half a dozen family enterprises working more than 100 feddans, and maybe 15 to 20 in the range between 50 and 100 feddans. The maximum is around 300 feddans (two cases).

There are few other activities in the village besides agriculture. The government employs a number of people as teachers, clerks, agricultural officers, and workers. A substantial number of people reside in Musha but commute to work in Assiut or other nearby villages. There are no factories or large businesses. Surprisingly, there is not even a workshop for tractor repair, unless the proximity of Assiut is a reason.

The cadastral survey for Assiut was carried out in 1905, and this still forms the reference point for the landholding system. The first agricultural machines were introduced in the 1930's. There were a few tractors, but of more importance at that time were stationary pumping engines which provided irrigation water from the water table and so permitted year-round irrigation. These engines were financed by the wealthy people, including some who were just acquiring wealth from labor contracting. These same people often bought up land relatively cheaply to go with their engines; the value of the land increased with year-round irrigation. Many of the contemporary big families owe their position to the events of this period. But the current layout of the land and the water distribution system derive from the construction of the Aswan High Dam (completed in 1965). The last annual flood was in 1965, and since then the stationary pumps have been used to pump water from a newly created network of irrigation canals. However, the land had been permanently irrigated for a generation prior to this switch. Despite the pattern of large landholding, land reforms under Abdel Nasser in the 1960's only affected about 135 feddans of land in the village.

Agricultural mechanization in Musha includes about 65 stationary pumping engines and about 50 tractors with their various attachments. Land preparation, threshing, and water lifting are virtually totally mechanized, and transport is largely so. On the other hand, weeding and hoeing, harvesting, winnowing, loading and unloading, and irrigating are all done by hand. Thus machines have replaced animals, not men. The demand for labor remains high, and remains seasonal. In some areas, the introduction of machines has clearly increased the demand for labor (year-round irrigation requires more labor to irrigate than a once-a-year flood). Hiring labor usually costs the farmer more money than hiring machines.

The claim of the larger farmers that mechanization is needed because of a labor shortage has some validity, but the paradox is not thereby resolved.

The most relevant form of social organization for agriculture is the household; the social organization of Musha agriculture assigns many tasks to the household. The form of mechanization currently present is compatible with this structure. Mechanized jobs generally do not require large gangs of hired labor, nor a high degree of coordination among those who work. The jobs that do require large gangs (harvesting, hoeing and weeding) are precisely the ones that have not been mechanized. Complaints about a labor shortage center around these jobs. For the moment, however, the household as the basic means of organizing agricultural work has not been threatened. In some cases, such as the threshing of sorghum, mechanization has even made possible a return to family labor.

Musha both imports and exports labor. The village has long been a source of seasonal contract labor to the Delta, and of longer-term migration to Suez, Alexandria and other cities. Currently there is substantial migration to the Arab countries, particularly to Saudi Arabia, and the pattern of contract seasonal labor has virtually disappeared. For certain kinds of jobs, Musha imports labor from nearby villages, notably those with higher population densities. Such labor is often used for the jobs that require large gangs of men, such as harvesting lentils or chickpeas. Thus the tasks most likely to generate collective feeling are accomplished with people from outside the community.

Most tractors are owned by the holders of 25 feddans or more. The availability of this machinery makes it possible for small households to continue farming, but it also tends to concentrate skills as well as machines in the hands of a relatively few. The poorer households are purchasing services from the richer ones, whose goal is to make a profit, not necessarily to ensure mutual survival. One might argue that the trend is towards the concentration of land and the increase in the size of the farming units to correspond to the capacity of the machine. That this has not yet happened is due to the continued presence of many tasks that must be done by hand and which are more efficiently organized at the household level.

Among the issues that these data should bear on is the much debated one of mechanization and labor displacement. For reasons given above, I am not convinced there is much labor displacement, but in any case the question seems too simply formulated. Another critical issue of relevance to population and development is the impact of mechanization on sexual and age-based divisions of labor, and on the role of the household in agricultural production in general. So far the effect seems slight, but it may well increase in the future. The most obvious effect of mechanization appears to be in the area of class differentiation. Mechanization is one of several factors that is encouraging a small stratum of farmers

to emerge into a dominant role in the village. However, the full exposition of these arguments must await the complete analysis of the data.

During my year of tenure as a fellow of the American Research Center in Fgypt I benefited greatly by the intellectual exchanges generated through the Center. Although I was in the field much of the time, I found the weekly seminar series both useful and enjoyable. Some of the work described was directly relevant to my own, and the work that was further afield helped me broaden my appreciation of the Egyptian and Arab society. The Center staff was also helpful in getting me the necessary permissions to carry on the research. It should be mentioned that this research had the support of the village authorities and the semi-official endorsement of the Faculty of Agriculture at the University of Assiut to whom I presented some of my research findings in a seminar in April, 1981.

ARCE Fellow 1980-81
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Cairo

SELECTION OF THE STONE FOR RESTORATION OF THE SPHINX

This note is to provide information and to point out the necessity of developing performance criteria for the selection of new stone blocks to replace those which are highly deteriorated at the Sphinx. This note also deals with the specifications for mortar for use in laying the new stone blocks.

The decay of the existing stone blocks has occurred due to the presence of salts (halite and gypsum) in the stone. These salts were inherently present in the stone blocks and the bed-rock, but they have also been derived in part from mortars.

These salts are harmful to the stone because they dissolve easily in water and then crystallize when the water evaporates during the heat of the day. The crystallization pressure disintegrates the stone.

The soundness of the stone at the Sphinx is dependent upon the type and quantity of salts, and the mechanical strength and porosometric characteristics of the stone. The selection of new stone must be based upon an optimum combination of these properties.

An analysis of common limestones quarried in the environs of Cairo and determination of their soundness will provide direction for the selection of replacement stone. This selected stone may possess the optimum combination of properties named above. But if it does not, the salt content of this stone shall have to be reduced, which will mean that a stone with lesser strength and having less than optimum porosometric characteristic may yet be usable. Because it is impractical to remove completely all salts, laboratory investigations will be needed to determine the optimum level of salt content. Also, the said properties of well-preserved stone of past restoration ought to be made a basis for the specification for new stone.

The design of the mortars should be based on similar factors, e.g., the absence of salts, mechanical strength and water absorption characteristics; these should be somewhat similar to those of the selected stone.

The scope of this work is quite extensive and demands experience in the study of stone. I expect that an exhaustive study for a period of six months to a year will produce information adequate to begin the job of replacing badly weathered stone and mortar from the veneer of the Sphinx.

K. Lal Gauri
University of Louisville

NEWS OF OTHER ORGANIZATIONS

International Glass Conference

An International Glass Conference will be held in the U.S. June 7 through 12, 1982. Working sessions and related activities are scheduled in New York City, Corning , N.Y. and Toledo Ohio.

The Conference is being sponsored jointly by the Corning Museum of Glass, the Metropolitan Museum of Art and the Toledo Museum of Art. It is expected to attract worldwide glass scholars, collectors and dealers interested in the historical, archaeological, artistic and museological study of glass as well as its technology and conservation.

Conference highlights include reports by leading glass scholars on the latest archaeological and scientific discoveries in the field of glassmaking and glass history. . Also Conference participants will have the opportunity to see some of the greatest glass collections in the world, as well as to tour the stained glass exhibit at the Cloisters, New York City, and the cameo glass exhibition at the Corning Museum of Glass.

Additional information about the Conference can be obtained by writing the Corning Museum of Glass, Corning, N.Y. 14830, Dwight P. Lanmon, Director.

Corrections:

The article "Detioration of the Stone of the Great Sphinx" which appeared in Newsletter 114 (Spring 1981) should have recognized Professor G.C. Holdren, Jr. of the University of Louisville as co-author. We sincerely regret this oversight.

Inadvertently the officers listed on page 2 of Newsletter #115 (Summer 1981) were not changed. Our new President is Klaus Baer and the Vice President is Charles Butterworth and both names should have appeared in that issue.

THE BERKELEY MAP

OF THE

THEBAN NECROPOLIS

REPORT OF THE FOURTH SEASON, 1981

ACKNOWLEDGEMENTS

THE BERKELEY MAP OF THE THEBAN NECROPOLIS

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OUR THANKS

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The University of California, Berkeley: Dr Frank Norick, Mr Grant Barnes, Mr Czeslaw Grycz, Miss E.R. Taylor, Ms Jean Colvin

The California Department of Transportation: Mr George Katibah

The American Research Center in Egypt: Dr Paul Walker, Dr James Allen

The Lietz Company Towill, Inc. Chicago House Dr Lanny Bell
Roger Butler Cartography/ Graphics Miss Elizabeth Thomas

cover : Scene from chamber G in the tomb of Nefertari, Valley of the Queens (QV 66).

SUMMARY

No area of the world contains as many famous and important archaeological monuments as the West Bank at Luxor. Yet, in spite of centuries-old interest in such features as the Valley of the Kings, the Tombs of the Nobles, and scores of other monuments, there exists no accurate or complete map of the Theban Necropolis. Fewer than ten per cent of its monuments have ever been mapped and planned, and very few of these have been plotted accurately.

This project seeks to establish a survey network over the Theban Necropolis; to prepare a suitably detailed 1:500 archaeological map with 1:200 and 1:100 plans and sections of significant archaeological features; to publish these maps and plans together with more detailed records of measurements, in an accurate and permanent form, and to accompany these graphic aids with a concordance and catalogue of West Bank archaeological materials.

Such a project as this will provide a useful tool for Egyptologists; but it also will play a significant role in the preparation of long- range plans for the protection and preservation of the rapidly- deteriorating monuments at Thebes.

During the first season of the project, in 1978, a grid network was established on the West Bank and several tombs in the Valley of the Kings were planned.

During the second season, in 1979, the project obtained complete vertical aerial photographic coverage of the Necropolis. Two sets of each of two complete runs were made, two at 3,000 feet to provide stereoscopic photography for topographical maps at 1:500, and two higher runs, at 5,000 feet, for maps at a scale of 1:2,000. In addition, the project continued mapping tombs in the Valley of the Kings.

During the third season, in 1980, the project obtained a full series of oblique aerial photographs of all archaeologically important areas at Thebes. It completed its work in the Valley of the Kings.

During the fourth season, which ran from late March through mid-June, 1981, the project:

- mapped all accessible tombs in the Valley of the Queens and adjacent wadis;
- mapped all surface features of archaeological interest in the 3-km.-square area between QV and KV;
- developed computer programming for the preparation of tomb plans, elevations, and axonometric drawings;
- extended the Necropolis-wide traverse to the southern and northern limits of the archaeologically-relevant West Bank area;
- continued its work on the toponymy of the West Bank.

PROGRESS DURING THE FOURTH SEASON

The fourth season of the Berkeley Theban Mapping Project, which began in late March and continued through mid-June, 1981, was largely devoted to work in "The Place of Beauty," known today as the Valley of the Queens (QV). Eighty tombs are known here, 41 of them corridor tombs, 39 of them pit tombs, and of these about 60 were sufficiently free of debris to be mapped. (In a great many cases, "accessibility" meant little more than that there was a tiny crawl space through the entrance. Many times, team members had to work in tomb chambers lying on their backs on piles of mummified remains and fill that came to within thirty or forty centimetres of the ceiling, all the while trying to ignore hundreds of bats and crumbling stone. Many of these tombs have not been explored in over 70 years. It is a tribute to these staff members that, in spite of all this, mapping proceeded with no reduction in the accuracy for which the BTMP has become known.)

The eighty tombs in QV have only rarely been studied. Known to the early Copts, and often used by them as dwellings, they first were described in print by Hay (who mentioned seven of them), by Wilkinson (who mentioned about thirty), Champollion (sixteen), Lepsius (fifteen), and Brugsch (twenty). It was not until the work of Schiaparelli and Ballerini, from 1903 to 1905, however, that most of the tombs were located. Little of their work in QV was ever published, but it is to them that we owe the tomb numbering system used in QV today.

The tombs in the Valley of the Queens, most of which belonged to various members of the royal families of dynasties 19 and 20, are by no means as well carved or decorated as those in KV. The corridor tombs, generally small and decorated with low relief or paint, lie along the eastern and southern slopes of the Valley; the pit tombs, mostly undecorated, lie an average of 4 to 6 metres below ground, in a stratum of poor-quality stone at the entrance to QV. These latter are the most poorly-preserved of the QV tombs and the most difficult of access. The tombs in QV are almost all in poor condition: most are in need of conservation and stabilization. The tomb of Nefertari, of course, stands as the best (or worst) example of this. Several tombs that lie directly beneath the paved road and parking area have collapsing ceilings that threaten a future disaster if tourist busses are not prohibited in the area. Several tombs already have collapsed to the point that their chambers resemble little more than natural caves. We hope that the maps and plans we are preparing will help make protective work in QV possible.

During four years of work at Thebes, the surveying techniques used by the BTMP in preparing tomb plans and sections have gradually undergone changes designed to insure more efficient and more accurate notes and drawings. With our decision last year to give computers a greater role in the preparation of plans and axonometric drawings (for reasons of accuracy and economy), we standardized those techniques in what now may be considered their final form. It is worthwhile outlining these procedures here. In our next annual report, we will discuss the role of the computer in our work and will outline the laboratory work involved in tomb planning.

The BTMP tomb survey method consists of using azimuths (horizontal angles), zenith angles (vertical angles), and slope distances (the distance from the theodolite to the point being measured) to define the architectural features within a chamber. These features include corners, jambs, pillars, niches, any element felt to be relevant. A rough plan and section of the chamber are drawn and each feature is numbered on the plan (see figure 1). The measurements taken to each of these features are then lettered according to their vertical position (see figure 2). Following this method of notation, a measurement taken to the ceiling at corner 2 of chamber B would be designated B2a. If the corner appeared to be well cut and no intermediate measurements were considered necessary, the next measurement would be to the floor and would be designated B2e. In this way, all "a" measurements are to the ceiling, while all "e" measurements are to the floor. The "e" azimuths and trigonometrically-derived horizontal distances are those used in drawing the basic plan of the tomb.

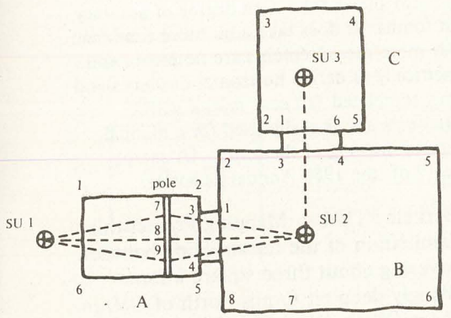


figure 1

The letters "b" through "d" may be used to describe intermediate measurements down a wall when these are necessary to describe a vertical curve or irregularity. The letters "b" and "d" are also used at doorways: "b" to describe the top of a jamb when this meets a lintel rather than the ceiling; "d" to describe the bottom of a jamb when it meets a step rather than the floor. Letters "b", "c", and "d" are also used to designate niches and shelves.

In a tomb where the walls of a chamber are irregular or where the ceiling is vaulted, extra measurements are taken along the walls or ceiling. The horizontal locations of these measurements are numbered on the plan and then lettered according to vertical position.

This method of measurement and notation is used in the entry-way of the tomb as well as inside. The theodolite is set up over a previously established control point, the features of the entry-way are measured and a new control point or "set-up" (su) is established in the next room to be mapped. As far as possible, the set-ups are located at 90, 180, or 270 degrees from the previous set-up (and zero degrees is set at the previous set-up). We also have found it useful to have at least two measurements overlapping from one set-up to the next. For example, the "a" measurement to jambs C1 and C2 would be measured from both su2 and su3. The overlapping measurements provide a quick check for mathematical and measuring errors.

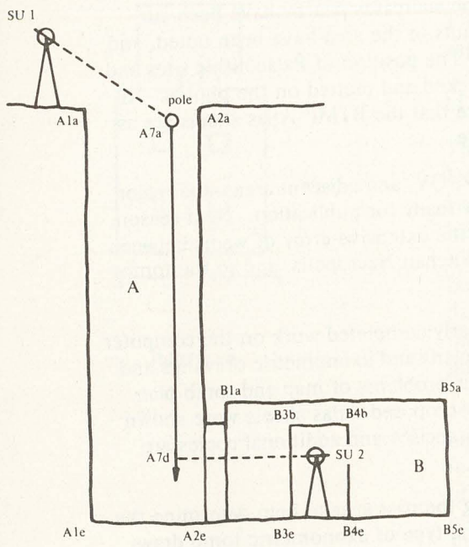


figure 2

A slightly different method for setting inside control points must be used in shaft tombs because of the impossibility of sighting into a tomb chamber from an outside control point at the edge of a shaft. From the initial set-up we measure angles and distances to the upper edge of the shaft. Then three plumb bobs are hung from a well-anchored pole so that the tips of the plumb bobs are visible from inside the tomb. Angles and distances are measured to the plumb bob strings just below the pole and then careful measurements are taken from the these points to the tip of the respective plumb bob. Next, the theodolite is set up on an arbitrary point inside the tomb and measurements are taken to the plumb bob tips (one of which is used as zero degrees). The horizontal position of the arbitrary set-up may be determined by using the azimuth measurements while the vertical position of the point may be determined by using the zenith measurements. (While only two sets of measurements are absolutely necessary, we usually use a third plumb bob as a check).

If the shaft is irregular, intermediate measurements may be taken at one metre intervals. The horizontal position of each corner can be fixed by measurements from at least two plumb bob strings. If there is more than one chamber within a shaft tomb, the mapping proceeds as with any other tomb.

The procedure we are now using provides information that is easily adapted for the use of a computer and also allows for a high degree of accuracy when dealing with irregularly cut tombs. It does take a bit more time than other methods, however, because more measurements are necessary and these must be reduced trigonometrically to derive horizontal distances and elevations. Once data reduction is completed (an easy matter with modern calculators), the measurements are as easily used for a manual drawing as for a computer- generated drawing of the tomb. (A sample data form may be found on page 19 of the 1980 Annual Report).

In addition to its work in QV, the Berkeley Theban Mapping Project this season also completed a detailed examination of the terrain lying between QV and KV, an area of surveying covering about three square kilometres. The fifteen isolated and surprisingly deep pit tombs north of QV, in what Elizabeth Thomas calls Wadi Rumi(WR), Wadi Habl(WH), Gebel Rumi(GR), and the Wadi of Prnce Ahmose(WPA), were planned and sectioned. (One had a shaft over nine metres deep). All features of archaeological interest have been noted on the aerial photographs and checked on the ground, and grid coordinates have been established for each feature noted. The one hundred or so stone shrines lying on the hillside above the southern end of KV have been mapped and described, and the long, well-constructed stone staircases nearby have been surveyed. Traces of stone walls and huts in the area have been noted, and survey markers placed near them. The position of Palaeolithic sites and more recent ateliers have been checked and plotted on the photos. All this "clean-up" work will help insure that the BTMP Atlas sheets are as accurate and as complete as possible.

With the completion of work in KV, QV, and adjacent areas, the major royal necropoleis at Thebes are now ready for publication. Next season, we shall devote our field season to the extensive array of wadis between QV and the southern limits of the Theban Necropolis, and to the tombs and structures at Deir el-Medineh.

In the laboratory, the BTMP has nearly completed work on the computer programs needed to generate tomb plans and axonometric drawings and we have been studying the numerous problems of map and tomb plan publication format. (Samples of our proposed Atlas sheets were shown at the 1980 ARCE meeting in San Francisco and additional copies are available to interested parties).

A number of tests were made during the past year to help determine the most efficient means of generating the type of axonometric tomb drawings first illustrated in last year's Annual Report. Changes in the format of our field notes were followed by changes in our laboratory procedures. Among other things, they resulted in the preparation of an animated film of an axonometric drawing of the burial chamber of the tomb of Ramesses II. This film will be shown on a National Geographic Society television special in February, 1982. An axonometric drawing of the entire tomb (KV 7) is shown in the center of this report and illustrates one of the problems with which we have had to deal: the inclusion of inaccessible chambers.

In the tomb of Ramesses II, as in other tombs in the Valley of the Kings, chambers are often so heavily encumbered with mud, rubble, and debris, that it is not possible even to probe with a survey pole, much less gain access to them. Two such chambers in Ramesses II are those labelled Fa and Faa by Elizabeth Thomas. Because we cannot be certain of their precise form and dimensions, they are shown on our axonometric drawing in plan only. The plan we have used was one of two quite different plans that have been published. The most recent(figure 3), prepared in 1939 by Maystre and originally adhered to by Elizabeth Thomas, shows chamber Fa to have had only two columns and Faa to be equal in width to Fa. All earlier plans, however, beginning with that of Lepsius(figure 4), show Faa to be a much smaller chamber, and Fa to have had four columns. We have rejected Maystre's reconstruction in favor of Lepsius's because Maystre seems not to have had access to the two chambers, whereas Lepsius includes measurements on his tomb plan indicating that he did. (In a recent conversation, Elizabeth Thomas states that she, too, now accepts the Lepsius plan).

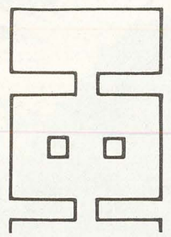


figure 3

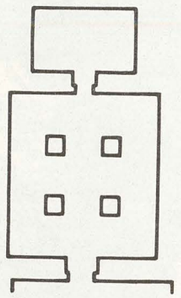


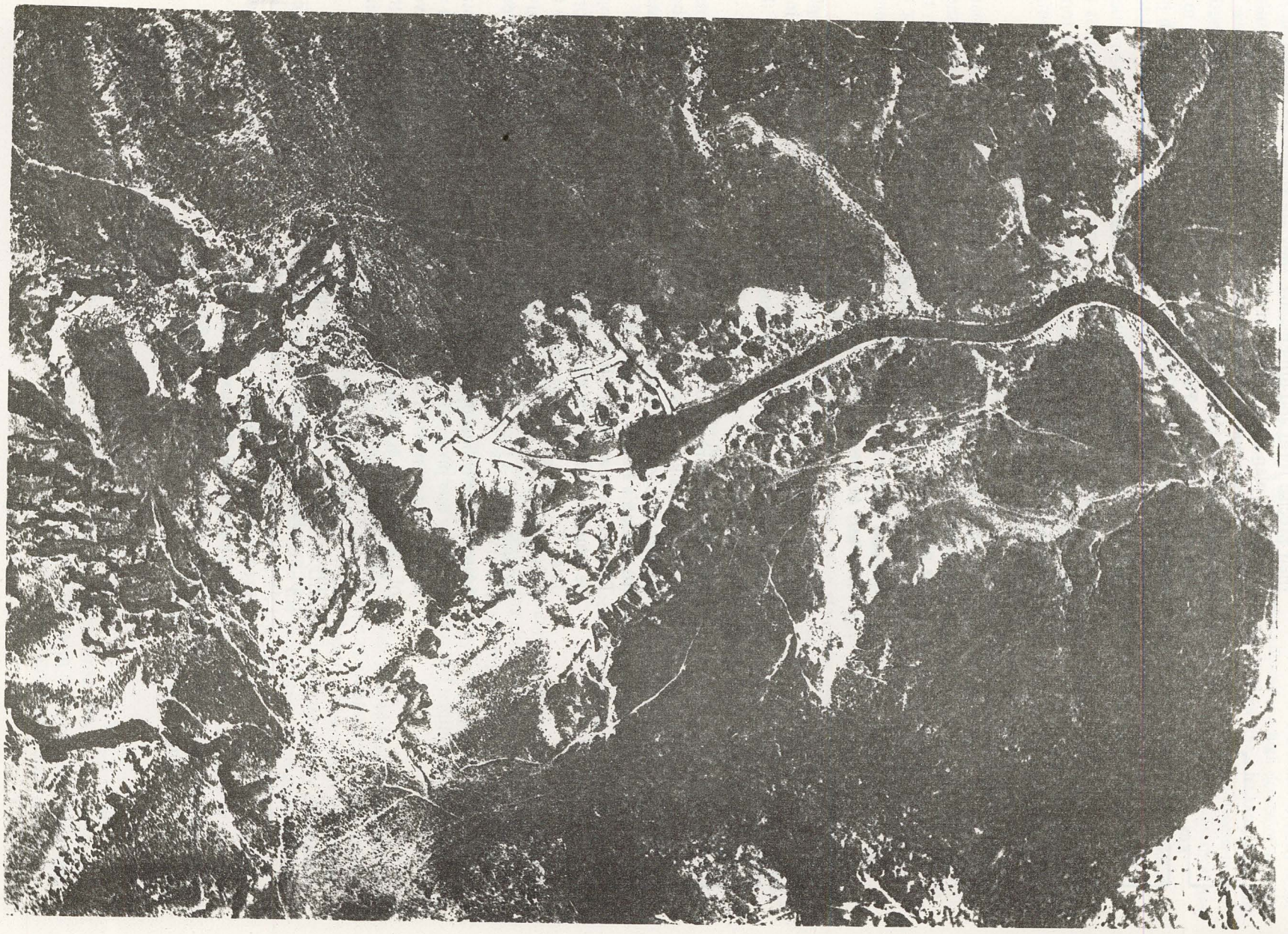
figure 4

The restoration of shelves along the walls of chamber J, the burial chamber, is based upon the following: Lepsius shows one such shelf in his plan; traces of a second shelf were visible during our work in the tomb; the plan of the chamber is otherwise so similar to those of Nefertari and Ramesses III, where such shelves are present, that it seemed necessary to assume their presence here, too.

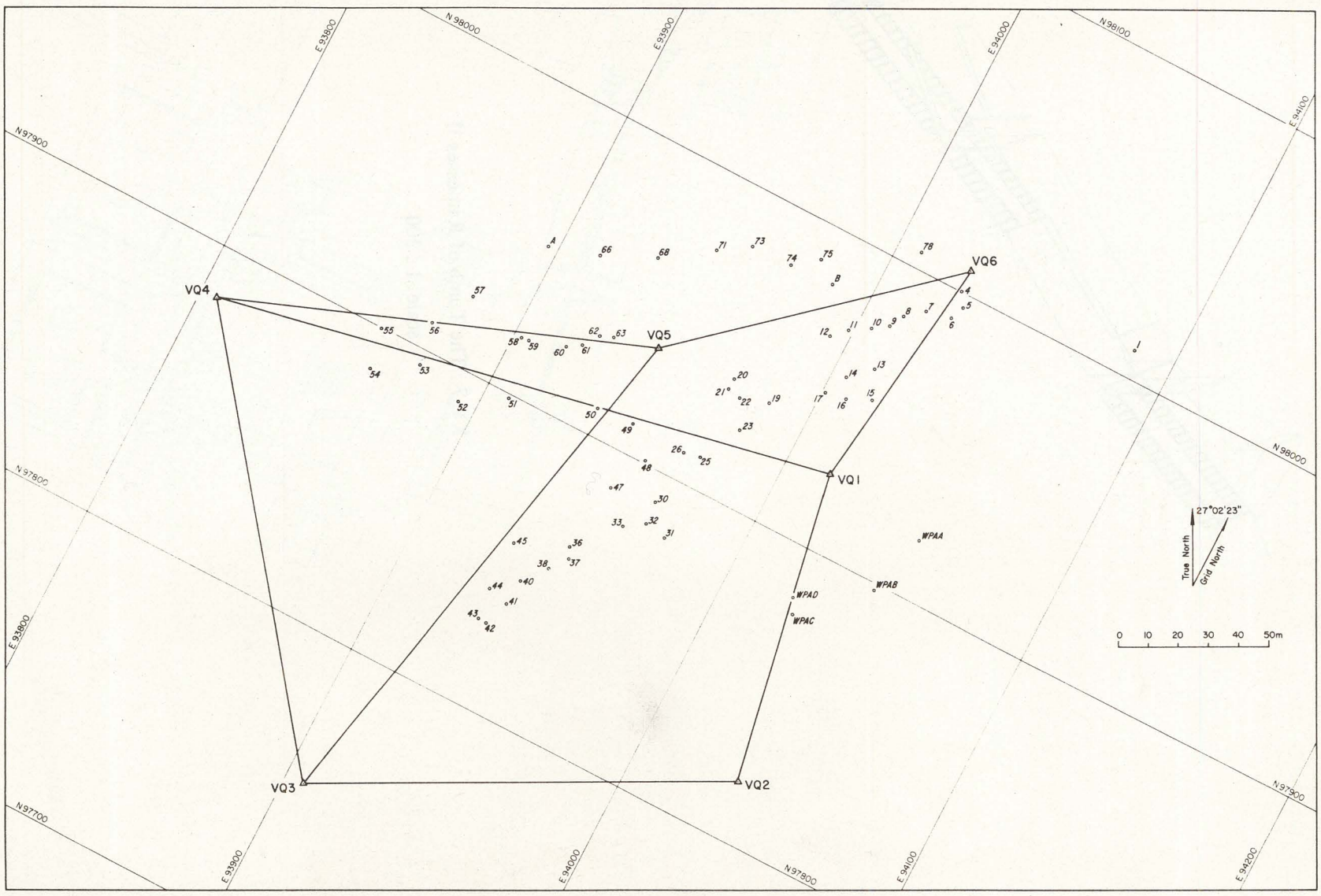
The inclusion of pillars in the rear chambers, shown in all tomb plans except that of Maystre (followed by Thomas) is certain: traces are in all cases visible on the ceiling and in one case a column rises above the level of chamber fill.

The greatest concern of the BTMP at the moment is a financial one. Dollar funding for our work from the National Endowment for the Humanities has ended, and there is the likelihood that the Smithsonian Institution's PL480 program in Egypt will terminate at the end of 1982. This means that other, almost certainly private, sources of funding must be found to insure the completion of fieldwork and the publication of our data. To meet this financial challenge, we plan to launch a major fund-raising campaign in the near future. Priority, of course, will be given to publishing in a proper and timely manner the data already gathered.

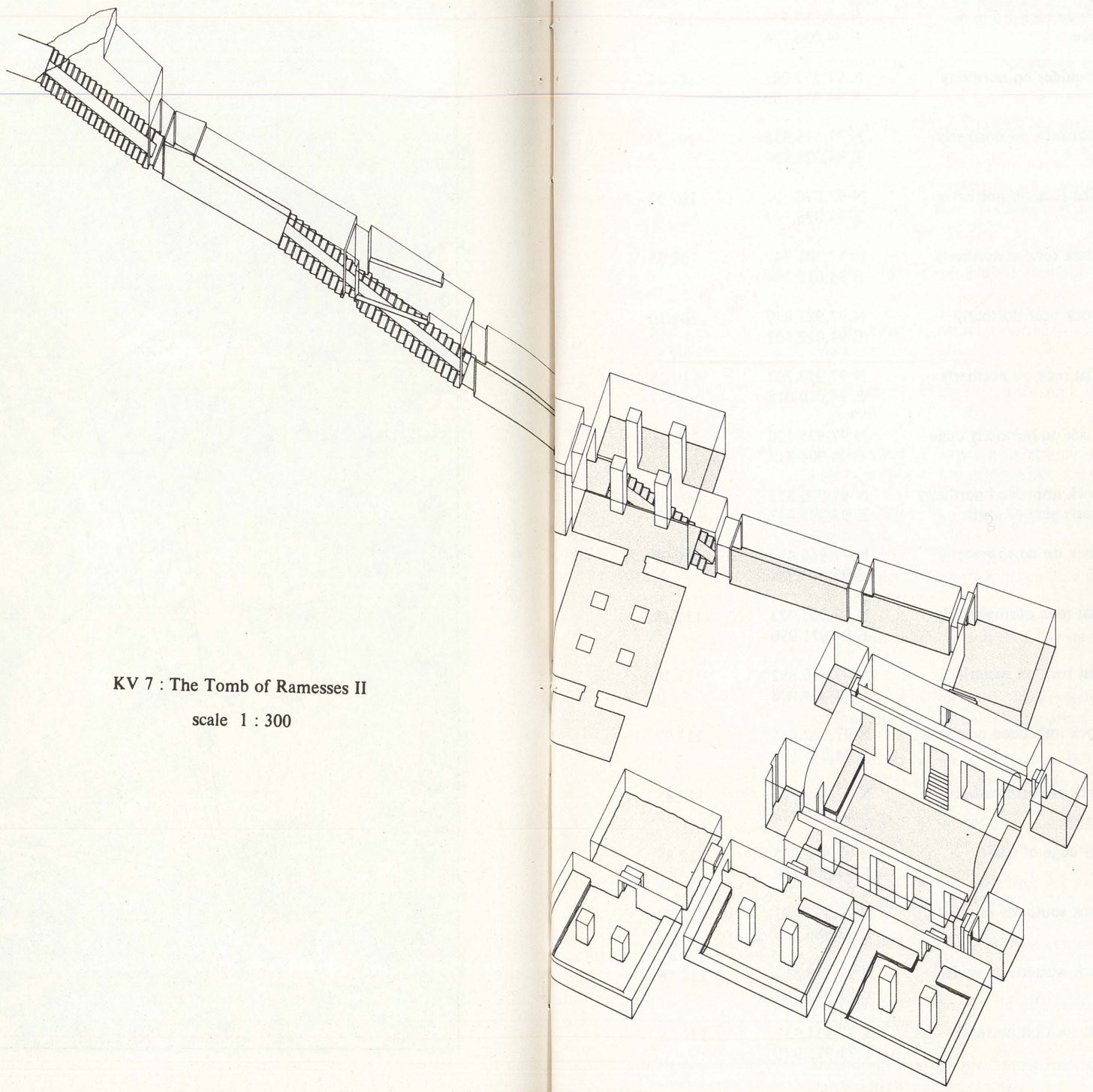
Many of our colleagues have expressed a wish that the aerial photographs taken by our project be made available for use. Our original plan was to include these in Atlas volume I. That, however, will be the last volume of the Atlas to be published. So, to avoid long delays and make these photographs available as soon as possible, we are planning to publish an 11 x 14-inch volume, *Views of Ancient Thebes*, that will contain about 75 of the most useful photographs. It will cover every archaeologically-significant part of the Theban Necropolis. We are certain that these vertical, oblique, and on- the-ground views will be of great use to Egyptologists and to those who have been entrusted with the development of the Luxor area.



Vertical Aerial Photograph of Valley of the Queens



Valley of the Queens: Position of Known Tombs



KV 7 : The Tomb of Ramesses II

scale 1 : 300

STATUS OF QV TOMB MAPPING

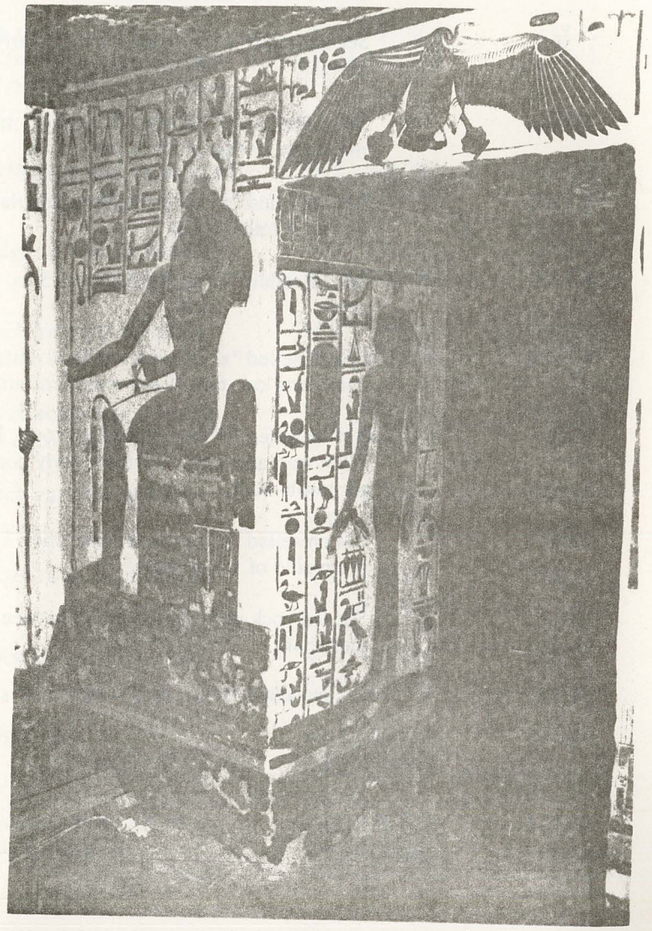
Tomb Number	Mapped	Point Description and Location	Adjusted Coordinate	Elevation
1	*	Set chiselled "x" on large rock 1.5 m. in front of tomb entrance.	N 98,009.759 E 94,086.126	106.41
4	*	Set chiselled "x" on boulder on northerly edge of shaft.	N 97,999.985 E 94,026.180	107.15
5	*	Set chiselled "x" on flat rock on northerly edge of shaft.	N 97,995.356 E 94,028.896	107.27
6	*	Set chiselled "x" on flat rock on northerly edge of shaft.	N 97,990.700 E 94,026.947	107.97
7	*	Set chiselled "x" on dark rock at northerly corner of shaft.	N 97,988.742 E 94,018.394	108.95
8	*	Set chiselled "x" on rock near northerly corner of shaft.	N 97,983.829 E 94,012.462	109.30
9	*	Set chiselled "x" on flat rock on northerly edge of shaft.	N 97,978.707 E 94,010.018	110.08
10	*	Set chiselled "x" on rock on northerly edge of shaft.	N 97,975.120 E 94,004.813	110.34
11	*	Set chiselled "x" on rock imbedded northerly of rock wall on northerly side of shaft.	N 97,970.875 E 93,998.448	109.61
12	*	Set chiselled "x" on rock on northwesterly edge of shaft.	N 97,966.454 E 93,993.768	110.99
13	*	Set chiselled "x" on flat rock northwesterly of tomb entrance.	N 97,963.423 E 94,011.990	111.28
14	*	Set chiselled "x" on flat rock on easterly edge of shaft.	N 97,956.682 E 94,004.908	111.79
15	*	Set chiselled "x" on rock imbedded northerly of shaft.	N 97,953.848 E 94,016.130	113.92
16	*	Set chiselled "x" on rock at northwesterly corner of entrance.	N 97,950.291 E 94,008.016	112.85
17	*	Set PK nail on easterly edge of shaft.	N 97,948.855 E 94,000.958	112.85
19	*	Set chiselled "x" on rock southerly of shaft.	N 97,937.233 E 93,986.256	113.79
20	*	Set chiselled "x" on rock westerly of shaft.	N 97,938.812 E 93,972.008	111.56
21	*	Set chiselled "x" on flat rock on northerly edge of shaft.	N 97,934.933 E 93,971.971	111.75

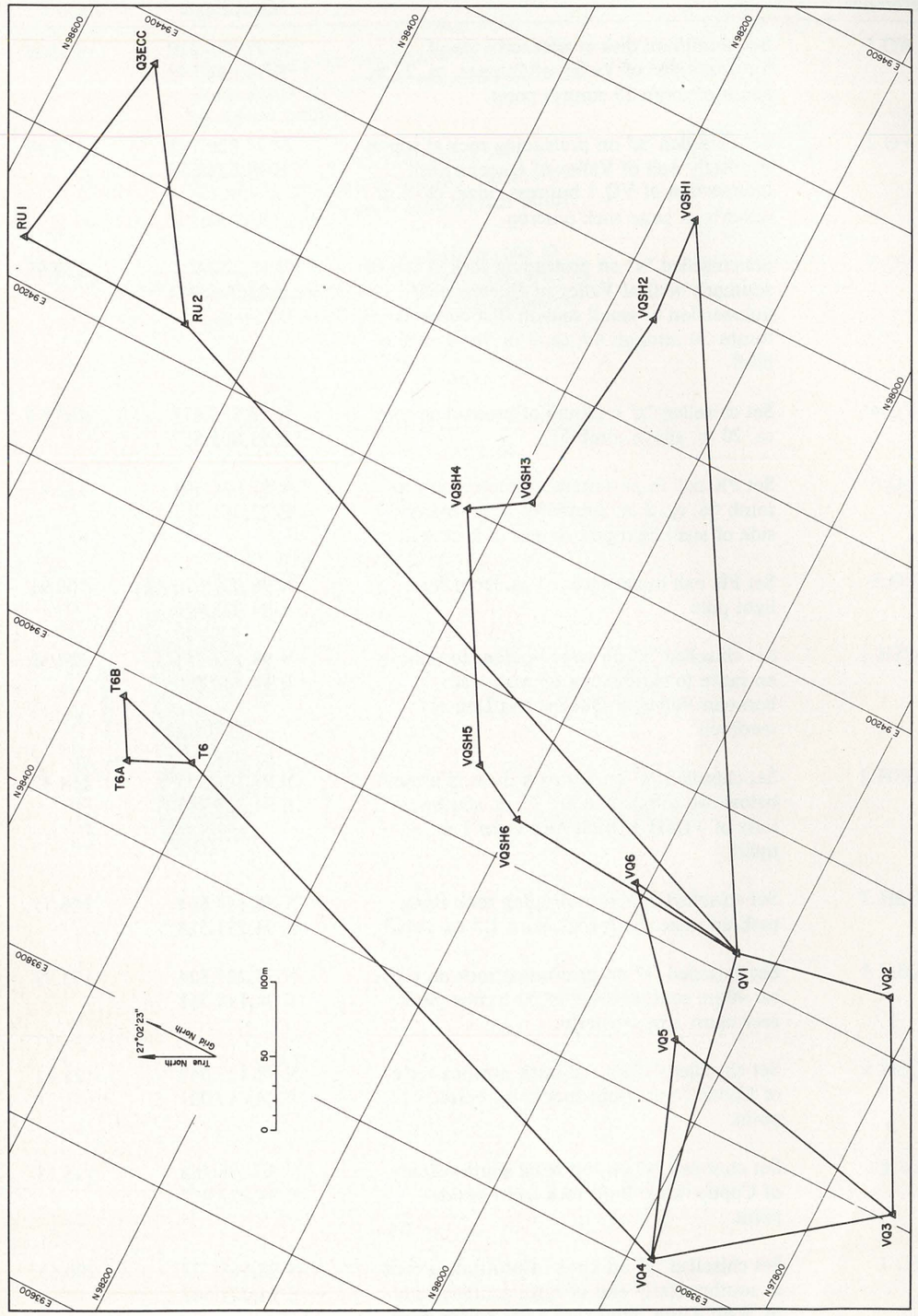
Tomb Number	Mapped	Point Description and Location	Adjusted Coordinate	Elevation
22	*	Set chiselled "x" on small rock northerly of shaft.	N 97,934.138 E 93,976.614	112.56
23	*	Set chiselled "x" on flat rock near entrance.	N 97,924.702 E 93,982.016	114.41
25	*	Set chiselled "x" on flat rock on westerly edge of shaft.	N 97,910.620 E 93,974.656	116.70
26	*	Set chiselled "x" on flat rock on westerly edge of shaft at base of talus, 1 m. northerly of northerly edge of shaft.	N 97,909.338 E 93,968.491	116.31
30	*	Set pencilled "x" on slightly protruding rock.	N 97,890.564 E 93,968.194	119.16
31	*	Set chiselled "x" on rock northerly of tomb entrance.	N 97,881.126 E 93,976.343	122.11
32		Set chiselled "x" on buried flat rock on downhill side of tomb.	N 97,882.604 E 93,968.856	120.63
33	*	Set chiselled "x" at northeasterly corner on large flat rock at top of entrance steps.	N 97,878.096 E 93,962.597	120.31
36	*	Set chiselled "x" on stone on edge of first tomb step.	N 97,863.550 E 93,949.670	119.86
37	*	Set chiselled "x" on rock protruding northerly of tomb.	N 97,859.939 E 93,951.467	121.28
38	*	Set chiselled "x" on center of top step.	N 97,854.109 E 93,947.243	120.86
40	*	Set chiselled "x" on center of westerly edge of concrete slab at top of tomb steps.	N 97,846.044 E 93,940.904	121.88
41	*	Set chiselled "x" on large rock ca. 0.9 m. from right entrance corridor wall.	N 97,836.830 E 93,940.824	123.64
42	*	Set chiselled "x" on bedrock at center of tomb entrance ramp.	N 97,828.167 E 93,937.612	125.42
43	*	Set chiselled "x" on small rock 1.1 m. from right entrance corridor wall.	N 97,828.374 E 93,934.503	126.04
44	*	Set chiselled "x" on bedrock at center of entrance corridor floor.	N 97,838.880 E 93,931.673	122.99
45	*	Set chiselled "x" on rock in dirt mound easterly of tomb entrance.	N 97,856.139 E 93,931.679	121.23
47	*	Set chiselled "x" on protruding rock at northeasterly corner of shaft.	N 97,887.842 E 93,952.868	116.99

Tomb Number	Mapped	Point Description and Location	Adjusted Coordinate	Elevation
48	*	Set chiselled "x" on flat rock on westerly edge of shaft.	N 97,900.908 E 93,959.088	115.33
49		Set chiselled "x" on rock easterly of entrance and rock wall and ca. 0.8 m. easterly of top tomb step.	N 97,909.849 E 93,948.727	114.99
50	*	Set chiselled "x" on rock wall northerly of tomb entrance.	N 97,909.114 E 93,935.849	113.74
51	*	Set chiselled "x" on top wall in front of tomb.	N 97,898.930 E 93,907.905	116.39
52	*	Set chiselled "x" on protruding rock 5.2 m. from tomb gate in entrance path.	N 97,889.621 E 93,893.480	115.98
53	*	Set chiselled "x" on rock 1.4 m. in from face of wall along tomb walkway.	N 97,894.450 E 93,876.629	115.21
54		Set PK nail on entrance floor 1.3 m. from left wall.	N 97,886.014 E 93,862.260	117.88
55	*	Set 30 mm. pipe flush on approximate axis line of tomb, 2.5 m. from northerly retaining wall of enclosure at bottom of four concrete steps.	N 97,899.465 E 93,859.378	117.17
56	*	Set chiselled "x" on retaining wall in front of tomb.	N 97,909.340 E 93,873.746	116.73
57	*	Set chiselled "x" on edge of wall in front of tomb.	N 97,923.219 E 93,881.759	117.67
58	*	Set chiselled "x" on rock easterly of tomb entrance.	N 97,918.412 E 93,902.403	114.88
59	*	Set chiselled "x" on rock southerly of southerly wall around tomb entrance.	N 97,918.643 E 93,905.140	114.68
60	*	Set chiselled "x" on rock easterly of tomb entrance.	N 97,922.609 E 93,917.098	113.88
61	*	Set chiselled "x" on large rock in northerly wall at tomb entrance.	N 97,925.575 E 93,921.698	114.15
62	*	Set chiselled "x" on rock on easterly side of tomb entrance.	N 97,930.765 E 93,925.281	113.76
63	*	Set chiselled "x" on small rock.	N 97,933.677 E 93,929.615	113.89
66	*	Set chiselled "x" on southeasterly part of concrete landing at top of stairs.	N 97,954.807 E 93,913.365	115.60

Tomb Number	Mapped	Point Description and Location	Adjusted Coordinate	Elevation
68	*	Set chiselled "x" on top step of tomb stairs, 0.7 m. from left wall.	N 97,962.976 E 93,930.619	115.97
71	*	Set PK nail in entrance corridor along line of far edge of 3 stones and 0.43 m. from right edge of left stone.	N 97,974.254 E 93,947.045	114.22
73	*	Set chiselled "x" in entrance corridor 0.64 m. from right wall.	N 97,981.029 E 93,957.137	113.93
74	*	Set 30 mm. pipe flush in approximate center of entrance corridor, 4.28 m. from stone on left and 4.63 m. from stone on right.	N 97,981.341 E 93,971.091	112.88
75	*	Set chiselled "x" on large rock 1.33 m. from left wall and 1.43 m. from right wall.	N 97,987.736 E 93,979.198	111.73
78	*	Set chiselled "x" on flat rock at easterly edge of shaft.	N 98,005.265 E 94,008.101	108.67
A (80)	*	Set chiselled "x" on stone in first step at center of entrance corridor.	N 97,949.515 E 93,896.736	117.24
B	*	Set chiselled "x" on rock northwesterly of shaft.	N 97,982.482 E 93,986.378	109.07
WPAA	*	Set chiselled "x" on flush flat rock 1 m. northerly of top of ramp into tomb.	N 97,919.358 E 94,051.572	110.57
WPAB	*	Set chiselled "x" on protruding angular rock at top of entry ramp.	N 97,897.570 E 94,045.860	115.66
WPAC	*	Set chiselled "x" on flush rock 1.5 m. outside tomb.	N 97,877.796 E 94,025.508	128.36
WPAD	*	Set chiselled "x" on rock on shelf outside tomb and ca. 6 m. from tomb entrance.	N 97,883.129 E 94,023.215	127.66
GR1	*	Set chiselled "x" on protruding rock, 1 m. in from wall and 2 m. northwesterly corner of pit tomb shaft.	N 98,502.788 E 94,248.606	197.35
GR2	*	Set chiselled "x" on protruding rock 1 m. out from side of tomb shaft.	N 98,550.394 E 94,192.242	197.60
GR3	*	Set flat rock with chiselled "x" between wall and shaft.	N 98,572.318 E 94,175.403	198.89
WRA	*	Set chiselled "x" on rock westerly of shaft.	N 98,233.743 E 94,154.559	119.47

Tomb Number	Mapped	Point Description and Location	Adjusted Coordinate	Elevation
WRD	*	Set chiselled "x" on protruding rock 1 m. from northeasterly corner of shaft; built rock cairn ca. 1 m. northeasterly.	N 98,233.115 E 94,178.280	125.90
WRG	*	Set chiselled "x" on lower (northeasterly) side of protruding rock, 1.5 m. from northwesterly corner of tomb shaft. Built cairn 1 m. northerly.	N 98,251.337 E 94,176.174	125.45
WRI	*	Set chiselled "x" on small protruding rock, 1 m. from northwesterly corner of tomb shaft. Built cairn ca. 1 m. northerly.	N 98,257.376 E 94,179.896	126.58
WRH		Set chiselled "x" on side knob of large rock at northwesterly corner of tomb shaft.	N 98,252.319 E 94,185.169	128.09
WHC	*	Set chiselled "x" on knob of protruding rock, 1 m. northwesterly of tomb shaft.	N 98,367.120 E 93,909.301	180.73
WHD	*	Set flat rock with chiselled "x" ca. 1 m. westerly of tomb shaft.	N 98,355.038 E 93,906.100	178.43





Valley of the Queens and Adjacent Area: Extension of Main Traverse

Point Reference	Point Description and Location	Adjusted Coordinate	Elevation
VQ 1	Set aluminum disk at northerly toe of buttress ridge of Valley of Queens, ca. 27 m. south of tomb 15 control point.	N 97,926.310 E 94,014.548	117.56
VQ 2	Set chiselled "x" on protruding rock at top of southerly wall of Valley of Queens near intersection of VQ 1 buttress ridge, ca. 2 m. easterly of large rock outcrop.	N 97,820.791 E 94,034.696	154.29
VQ 3	Set chiselled "x" on protruding rock at top of southerly wall of Valley of Queens near intersection of small canyon that contains tombs 20 through 49, ca. 3 m. from edge of bluff.	N 97,752.977 E 93,905.942	159.91
VQ 4	Set chiselled "x" on knob of protruding rock ca. 20 m. above tomb 55.	N 97,883.673 E 93,805.557	135.54
VQ 5	Set PK nail in pavement at intersection to tomb 66, ca. 2 m. southerly of southerly side of steel light pole at end of rock wall.	N 97,936.504 E 93,945.475	112.47
VQ 6	Set PK nail in pavement 1 m. from steel light pole.	N 98,007.610 E 94,025.770	106.91
VQSH 1	Set chiselled "x" on large boulder to right of entrance to shrine area on main path between Valley of Queens and Deir el-medineh.	N 98,173.855 E 94,440.780	120.32
VQSH 2	Set chiselled "x" on flat rock flush in ground below two tombs that are 75 m. southwesterly of VQSH 1. Built rock cairn 1 m. uphill.	N 98,168.951 E 94,369.401	114.42
VQSH 3	Set chiselled "x" on protruding rock along path up ridge. Built rock cairn 1.5 m. uphill.	N 98,184.664 E 94,221.528	126.55
VQSH 4	Set chiselled "x" on protruding rock on ridge ca. 40 m. southeasterly of pit tombs. Built rock cairn 1 m. westerly.	N 98,221.824 E 94,198.868	133.99
VQSH 5	Set chiselled "x" on red brick northeasterly of Coptic ruins. Built rock cairn beside point.	N 98,137.048 E 94,049.001	126.02
VQSH 6	Set chiselled "x" on red brick southwesterly of Coptic ruins. Built rock cairn beside point.	N 98,098.488 E 94,027.967	125.18
RU 1	Set chiselled "x" on knob of protruding rock at southwesterly end of ridge southeasterly of Wadi Rumi. Built rock cairn beside point.	N 98,568.725 E 94,227.642	200.55
RU 2	Set chiselled "x" on protruding rock to left of path along the northeasterly slope of Wadi Rumi. Small rock retaining wall ca. 1 m. below point.	N 98,445.578 E 94,223.503	197.57
T 6 A	Set chiselled "x" on protruding rock at southwesterly end of "saddle" northerly of point T 6 . Built rock cairn beside point.	N 98,348.997 E 93,945.354	192.96
T 6 B	Set chiselled "x" on protruding rock at northeasterly end of "saddle" northerly of point T 6. Built rock cairn beside point.	N 98,370.313 E 93,982.821	192.20